Highlights in Patent Activity

U.S. DEPARTMENT OF COMMERCE
Patent and Trademark Office

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Highlights in Patent Activity 1971-1991

The United States Patent and Trademark Office (USPTO) has been challenged during the past two decades by significant growth in patent activity and the impact of this growth on USPTO operations. A dramatic rise in the patent activity of U.S. inventors and foreign inventors who obtain patent protection in the United States has resulted in a 60 percent increase in the number of patent application filings. More than 164,000 utility patent applications are now filed each year at the USPTO, compared to only 105,000 applications in 1971.[1] In response to this growth, the USPTO increased staff and reduced the average length of time required to examine a patent application from 24 months to 18 months. Major changes to the financial aspects of obtaining a patent have resulted in the successful implementation of a maintenance fee structure, similar to other countries, that provides for continued patent protection for the 17-year life of the patent. Today, the cost of obtaining and maintaining a patent in the United States continues to be most competitive compared to other countries.

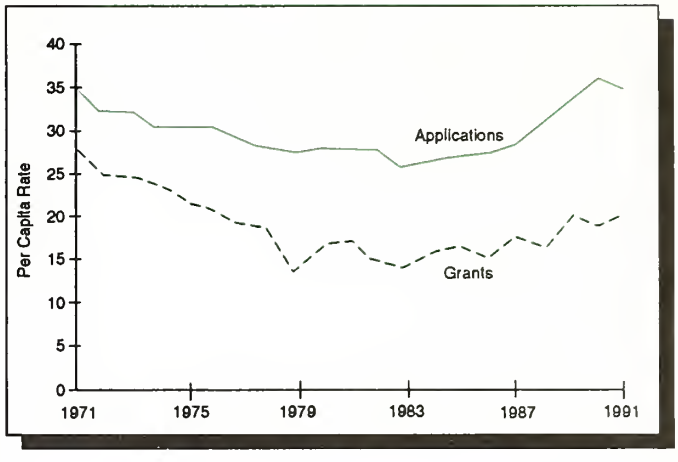
Patent activity of U.S inventors and foreign inventors who patent in the United States is highlighted in this section. References to figures and appendix tables in succeeding sections are also provided.

Since 1984 the patent activity of U.S. inventors has dramatically risen to near record levels.

In 1990 and 1991, the per capita application filing rates by residents of the United States were the highest in 20 years.[2] More than 36 patent applications per 100,000 U.S. population were filed in 1990 and slightly less than 35 applications per 100,000 were filed by U.S. residents in 1991. The resurgence in patent activity since 1984 follows a general decline in patenting from 1971 to 1983 when only 25 applications per 100,000 U.S. population were filed. (See Figure 1.)

Figure 1.

Application Filings and Patent Grants, U.S. Inventors, Rates per 100,000 U.S. Population, 1971-1991



Independent Inventors Continue to Play a Major Role In U.S. Patenting.

The number of patents granted to independent U.S. inventors increased by more than 70 percent from 7,561 patents in 1983 to 13,193 patents in 1991. While U.S. corporations continue to receive nearly three-fourths of utility patent grants for U.S. inventions, independent inventors have increased their share of utility patent grants from 23 percent in 1983 to 26 percent in 1991 (see Appendix Table A-2.) [3]

Patent activity in the United States increased in most states between 1971 and 1991.

The concentration of patent activity increased in 32 states between 1971 and 1991; 12 of these states were located in the south and 9 others were located in the west. Independent inventor activity has also become more prevalent in the western

[1] Utility patents are granted for inventions —about 92 percent of patent grants are utility patents. Other types of patent documents include plant, design, and reissue patents, plus Statutory Invention Registrations. This report only describes trends in utility patent activity.

[2] The identification of U.S. versus foreign inventions is based on the residence of the first-named inventor. Domestic, U.S. patent activity includes applications and grants with the first-named inventor a resident of the United States.

[3] Patent activity of independent inventors represents patents that were either unassigned or assigned to an individual at the time of issue.

United States where 7 out of 9 states with higher concentrations of independent inventor activity are located. (See Figures 3 and 4.)

The cost of obtaining a patent in the United States is most favorable compared to the cost of obtaining a patent in other major patenting countries.

The cost (as of October 1992) of obtaining a utility patent and maintaining patent protection for the life of the grant is approximately $7,500 in the United States, compared to $7,866 in Japan. Considerably higher costs are associated with patenting in the European Patent Office (EPO). Typical filing, issue and maintenance fees for an EPO patent can range from $12,883 for protection in one designated European country to $34,218 for protection in three designated European countries. (See Figure 13.) Despite recent increases in the cost of obtaining and maintaining a U.S. patent, there has not been any sustained, negative impact on patent activity in the United States.

Nearly half of all utility patents are for inventions by residents of foreign nations who apply for patent protection in the United States.[4]

In 1971, only 29 percent of all utility patents were granted to residents of foreign countries; by 1991 this figure had grown to 47 percent. This growth reflects the increasing importance of international trade and the high value placed on United States markets. Because patent rights do not convey from one country to another, foreign inventors are likely to obtain patent protection in several countries, particularly if the invention has significant commercial value in those countries. By obtaining patent protection in the United States, the foreign owner has the right to exclude all others from making, using or selling the patented invention in the United States. Foreign inventors who seek patent protection in the United States are more likely to reside in Japan, Germany, the United Kingdom, France, Canada, Switzerland, Italy, Sweden or the Netherlands. (See Appendix Tables A-1 and A-5.)

The countries of Asia show increasing levels of patent activity in the United States.

While Japanese inventors have dominated foreign patent activity in the United States since the mid-1970's, notable increases in activity by inventors from other Asian countries have occurred recently. The United States granted more than 400 patents to South Korean inventors in 1991, compared to only 45 patents granted in 1986. During the same time period, the number of patents granted to Taiwanese inventors grew from 208 patents to more than 900 patents. (See Appendix Table A-5.)

The technological emphasis of patent grants to U.S. inventors and to inventors from the major foreign patenting countries is on leading edge technology.

These technologies include biotechnology, chemistry, communications, information systems, and aeronautics. However, technologies that are emphasized by inventors from one country are less likely to be emphasized by inventors from other countries. For example, information storage and retrieval technologies are more emphasized by Japanese inventors who patent in the United States than by inventors from other countries. (See Figure 7.)

About 83 percent of utility patents remain in force following payment of a four year maintenance fee.

Utility patent protection typically lasts for 17 years. However, patent owners are required to make periodic maintenance fee payments to maintain this protection past 4, 8 and 12 years from the date of issue. About 83 percent of utility patents remain in force after 4 years and 63 percent remain in force after 8 years. (See Figure 11.)

Sources of Patent Data at the USPTO

The USPTO maintains one of the largest, most comprehensive collections of technological literature in the world. More than 5 million patents granted by the United States comprise a virtually continuous record of new invention and discovery that covers more than 200 years of United States history.

The who, what, where and when of each new invention are disclosed in patent grants that span

[4] Trends in foreign patent activity are not necessarily representative of all countries, since foreign patenting in the United States is dominated by Japan, which received 46 percent of all foreign patents granted in 1991. Many other countries have shown decreased activity in the United States at various times; however, this is not readily apparent from trends in total foreign patenting, due to the strength and growth of Japanese patenting.

the entire spectrum of technology. As technology continues to expand, patent grants are added to the USPTO collection at the rate of nearly 100,000 patents per year.

Traditionally, the patent collection has served the information needs of inventors, their attorneys and agents, and patent examiners involved in determining the patentability of new inventions. In more recent years, however, the patent file has become a valuable resource for a much larger community of users who research patent data from a decidedly different perspective. Within numerous academic and professional disciplines, there is growing recognition that trends in patent activity, observed over time and involving large numbers of patents, can indicate a great deal about the status of social and economic forces that guide and influence the inventive process.

The development of computerized data bases and retrieval systems at the USPTO has stimulated analysis of trends in patent activity and technical development. Enormous quantities of patent data have now become readily available for analysis.

Three data bases in particular have assisted the USPTO in its mission to administer patent law, to disseminate patent data and to further the competitiveness of the United States in the world technology market. USPTO's Technology Assessment Forecast program (TAF) data base contains bibliographic and status information on U.S. patents issued since 1963. These data provide the basis for analysis of domestic and foreign patent activity and technological development. Statistical summaries and trend analyses are disseminated to public and private organizations, other government agencies, and the general public through the use of standard publications and customized reports.

In addition, rapid access to the technical information disclosed in patent documents is provided through USPTO's Automated Patent System (APS). The APS contains the images of all patents issued since 1790 and the full text of more than a million patents issued since 1971. In addition to its use by patent examiners to perform text search and classified image searching, access to APS text search functions is available to the general public.[5]

Finally, the Patent Application and Location Monitoring (PALM) system is used by the USPTO to track the status and location of patent applications. The TAF data base, APS and PALM are the primary sources of data used to identify the patent activity trends described in this report.

Trends in Patent Activity--U.S. Inventors

Trends in patent application filings and grants show the technological output of U.S. inventors has steadily increased during the past decade. The record numbers of patent applications received by the USPTO in three of the past four years are a testament to the increase in inventive activity that has occurred among independent as well as corporate inventors. Equally important is the observation that inventive activity is increasing in geographic regions of the country not previously considered centers of technological development. Trends in applications and grants, ownership, and geographic distribution of U.S. inventors are described in this section.

Applications and Grants.

The per capita increase in U.S. inventor patent activity since 1984 reverses a general decline in patent activity from 1971 to 1983. Between 1971 and 1983, the application filing rate of U.S. inventors fell from 35 applications per 100,000 U.S. population to 25 applications per 100,000. This represented a drop in the number of U.S. inventor application filings from more than 70,000 in 1971 to less than 60,000 in 1983.

Beginning in 1984, application filing rates by U.S. inventors began to rise steadily. In 1990, when more than 36 applications per 100,000 U.S. population were received—the highest application filing rate in more than 20 years. In actual numbers, more than 90,000 applications from U.S. inventors were received in 1990. (See Appendix Table A-1.) The

[5] APS text search capabilities have been available to patrons of the USPTO Public Search Room since 1989; more recently, text search access has been available to patrons of selected Patent and Trademark Depository Libraries.

1991 application filing rate dropped slightly to 35 applications per 100,000; however, this decline may represent only a temporary fluctuation in the data.[6] The decline in application filings in 1991 may be partly response to the substantial increase in patent application fees in 1991 (from $495 to $800 for small entities [7] and from $990 to $1,680 for large entities). An unusually large, but temporary drop in application filings in 1983 also coincided with a substantial increase in application fees.

The USPTO expanded its staff to reduce "patent pendency time" (i.e., the period between application filing and patent issue or abandonment by the applicant) from 25 months in 1984 to 18 months in 1990. In 1984, about 38,000 patents were granted to U.S. inventors—equivalent to 16 patents per 100,000 U.S. population. Despite yearly fluctuations in the number of grants issued, the general trend in patent grants has been upward; by 1991, more than 51,000 patents were issued to U.S. inventors—equivalent to 20 patents per 100,000 U.S. population.[8]

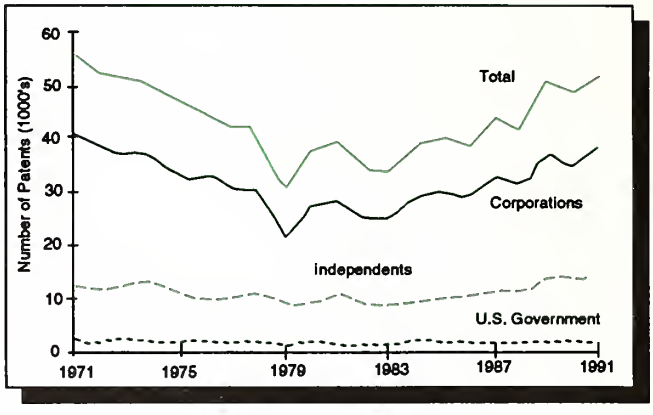
Ownership.

Nearly three-fourths of all patents issued to U.S.-resident inventors are owned by corporations and other private organizations. (See Figure 2.) The remaining patents are owned by independent inventors (i.e., individuals) or U.S. Government organizations. Between 1971 and 1991, corporations received 70 to 74 percent of the U.S. inventor patents issued each year and this share has remained at 72 percent for the past three years. (See Appendix Table A-2).

The distribution of U.S. inventor patents granted to each type of owner has been relatively stable over time, although independent inventors (the second largest group of patent owners) appear to be making small gains in the total share of patent grants. The share of U.S. inventor patents assigned to independent U.S. inventors increased from 23 percent in 1983 to 26 percent in 1989.

Figure 2.

Number of Utility Patent Grants by Ownership Type, U.S. Residents 1971-1991



Patenting by the U.S. Government declined steadily from 1971 when 4 percent of utility patent grants were issued to the U.S. Government, to 1987 when only 2 percent of utility patents were issued to the U.S. Government. [9] The U.S. Government has continued to receive about 2 percent of utility patent grants each year since 1987.

Geographic Distribution of Patent Activity--All U.S. Resident Inventors.

Patent activity in the United States is concentrated in the northeast, north central and, to some extent, western states—particularly California. [10] Historically, greater numbers of patent grants have been issued to inventors residing in those states than to inventors in other states. The number of patent grants issued is an important indicator of the amount of inventive activity within a particular geographic area. Moreover, by measuring patent

[6] Application filings increased at the end of fiscal year (FY) 1982 in anticipation of increased filing fees at the beginning of FY 1983. The number of patent grants can also show short term fluctuations, due to the USPTO budget, policy and staff resources. For example, insufficient resources to print patents in 1979 resulted in a temporary drop in the number of grants issued that year. Generally, however, patent grant data are more likely than application filing data to show temporary fluctuations.

[7] Small entities consist of independent inventors, small businesses with less than 500 employees and non-profit organizations.

[8] Per capita grant rates are lower than per capita application rates, since only about 57 percent of applications from domestic inventors mature into patents (based on an unpublished USPTO/TAF Report).

[9] The decline in patenting by the U.S. Government is due in part to the increased use of Statutory Invention Registrations (SIR) by the Government. SIRs are sometimes used by the Government in lieu of patents to disclose the technological information about new inventions. Restrictions on the manufacture, use and sale of patented inventions do not apply to SIRs.

[10] As early as 1900, California was one of the more active patenting states, ranked 10th out of 45 states in the number of patent grants, (USPTO, *Technology Assessment & Forecast*, 7th Report, March 1977)

activity on a per capita basis, it becomes possible to compare the relative strength (i.e., concentration) of inventive activity across geographic areas or periods of time. This is particularly important if inventive activity is viewed as a valuable human resource that contributes to the economic growth of an area.

The geographic distribution of U.S. patent activity is relatively stable over time. Higher concentrations of patent activity continue to be found in states located in the northeast and north central regions. Although declines in the concentration of patent activity have occurred in several states, the declines have, for the most part, been small and the overall trend has been toward increased activity in most states, nationwide. In addition, a particularly noteworthy development is the trend toward high concentrations of independent inventor activity in most western states.

The Index of Utility Patent Activity measures the extent to which patent activity is concentrated in each state and the District of Columbia. This index compares the percent distribution of patents, by state, to the percent distribution of population by state. A state with an index value greater than 1.00 means proportionately more patents are granted to inventors residing in that particular state compared other states. [11] (See Appendix Table A-3.)

Based on the Index of Utility Patent Activity, the greatest concentration of activity in 1985-91 was located in states that border the North Atlantic, Great Lakes and Pacific coasts: New Hampshire (1.32), Massachusetts (1.67), Connecticut (2.38), New Jersey (2.09), Delaware (3.11), Michigan (1.41), Minnesota (1.50) and California (1.26).

A comparison of average index values for the years 1971-77 and 1985-91 shows the concentration of utility patent activity (for all categories of patent ownership) declined in 17 states: 9 of these states were located in the northeast and north central regions; 5 were located in the south, and 3 states were in the western region of the country. The decline in patent activity in most of these states was relatively small—the index value dropped by more than .10 in only 5 states: Delaware (3.82 to 3.11); New Jersey (2.38 to 2.09); Illinois (1.50 to 1.05); Maryland (1.03 to .88); and the District of Columbia (.57 to .40). [12]

The concentration of patent activity, however, increased in 32 states between 1971-77 and 1985-91. (See Figure 3). Twelve of these states were located in the south; 9 states were in the west; 6 were in the north central region; and 5 states were located in the northeast region. For these states the index of utility patent activity increased an average of .15, with many states showing large increases: Minnesota (1.08 to 1.50); New Hampshire (.91 to 1.32); Oregon (.65 to .97); Washington (.62 to .88); Arizona (.84 to 1.07); Vermont (.78 to 1.00); Idaho (.43 to .65); and New Mexico (.44 to .64). Even states which continued to have very low concentrations of patent activity, nonetheless showed increased concentrations of activity.

Geographic Distribution of Patent Activity-- Independent Inventors.

Patent activity associated with independent inventors shows greater activity concentrated in the western states. (See Figure 4.) Four of the 6 states with the highest concentrations of independent inventor activity were in the west in 1971-77, and 7 of the 9 states with highest concentrations of activity in 1985-91 were also in the west. Ironically, California had the largest decrease in the concentration of independent activity of any state (1.85 to 1.26). Two other western states, Utah and Wyoming, showed very small declines in independent inventor activity. Increases in independent inventor activity occurred in 36 states, with the largest increases occurring in Montana (.78 to 1.50); New Hampshire (.82 to 1.17); Louisiana (.57 to .84); Idaho (.98 to 1.23); Vermont (.56 to .77); Arizona (1.39 to 1.60); and Washington (1.09 to 1.29). (See Figure 4 .)

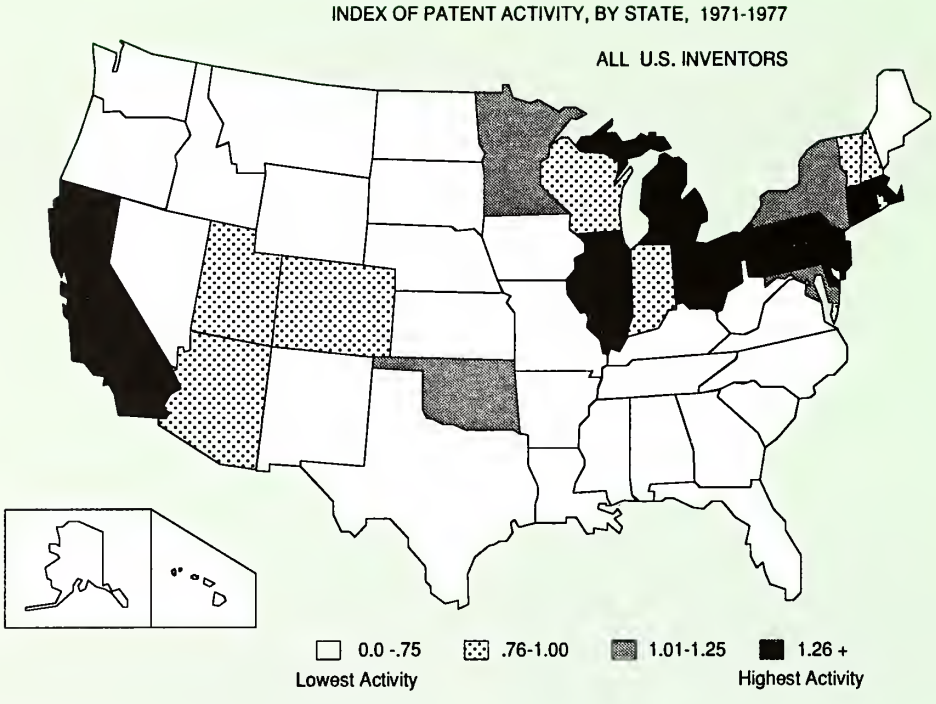
Independent inventor activity declined in 10 other states, 4 of which were in the north central region, 3 states in the southern region and 3 states

[11] A high index value of patent activity does not necessarily imply that inventive activity is widely dispersed throughout a state's population. A high index value could result from a large number of patents granted to many inventors, or a large number of patents granted to just a few inventors.

[12] The decline in Delaware, which has the highest concentration of patent activity in the nation, is not necessarily indicative of a long-term trend. In fact, the Delaware index has steadily increased from 2.70 in 1985 to 3.77 in 1991. Patent activity in Delaware is more likely to be affected by short-term economic conditions, since corporations account for more than 93 percent of the patent activity in Delaware.

Index of Inventor Activity by State, All U.S. Inventors, 1971-77 and 1985-91

1971-1977



1985-1991

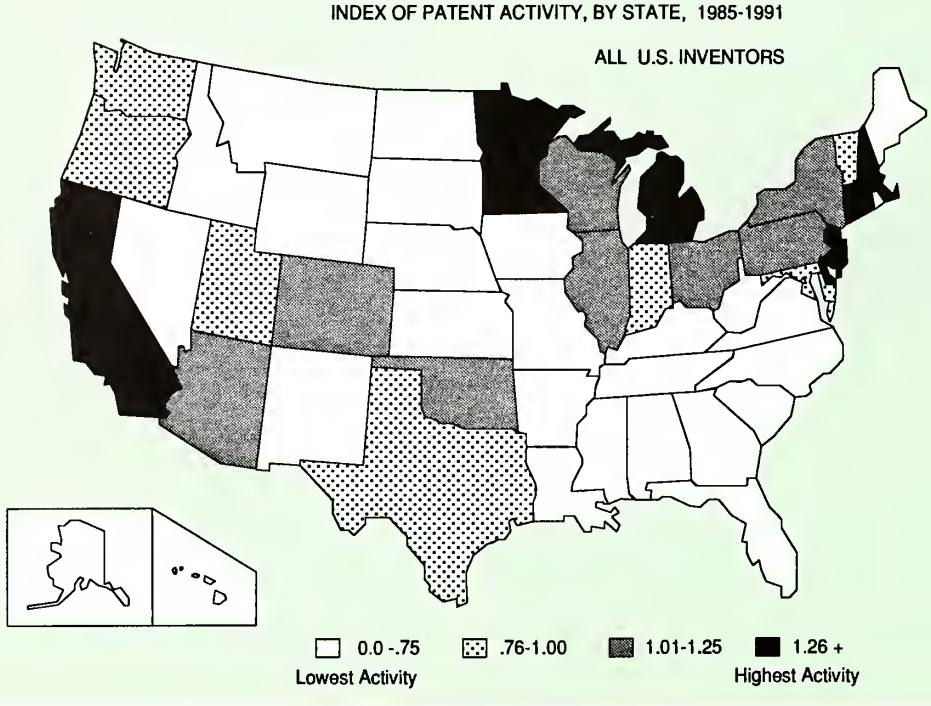
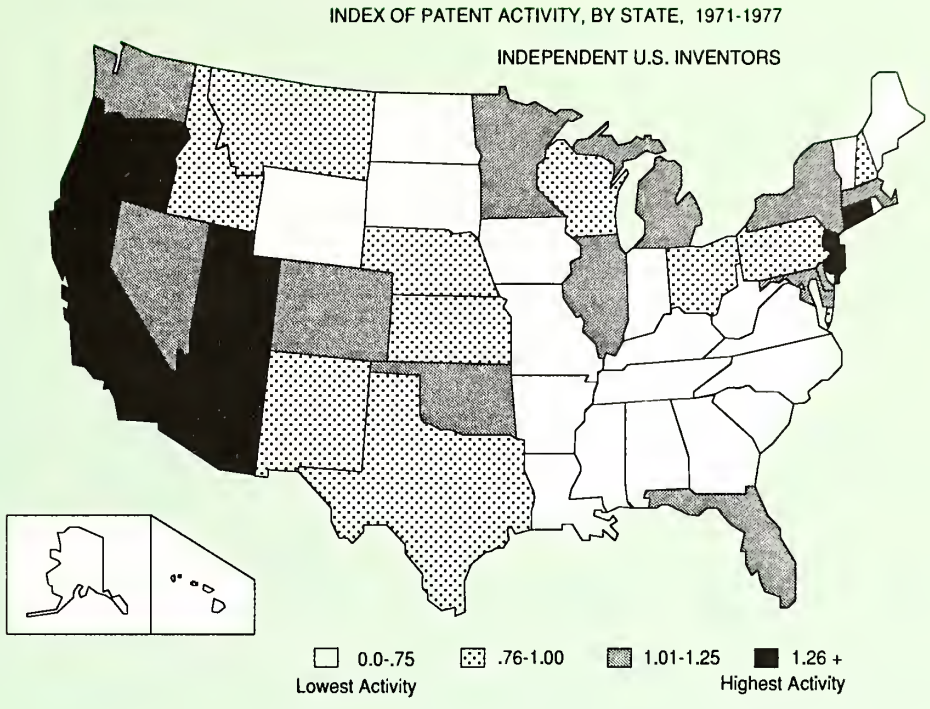


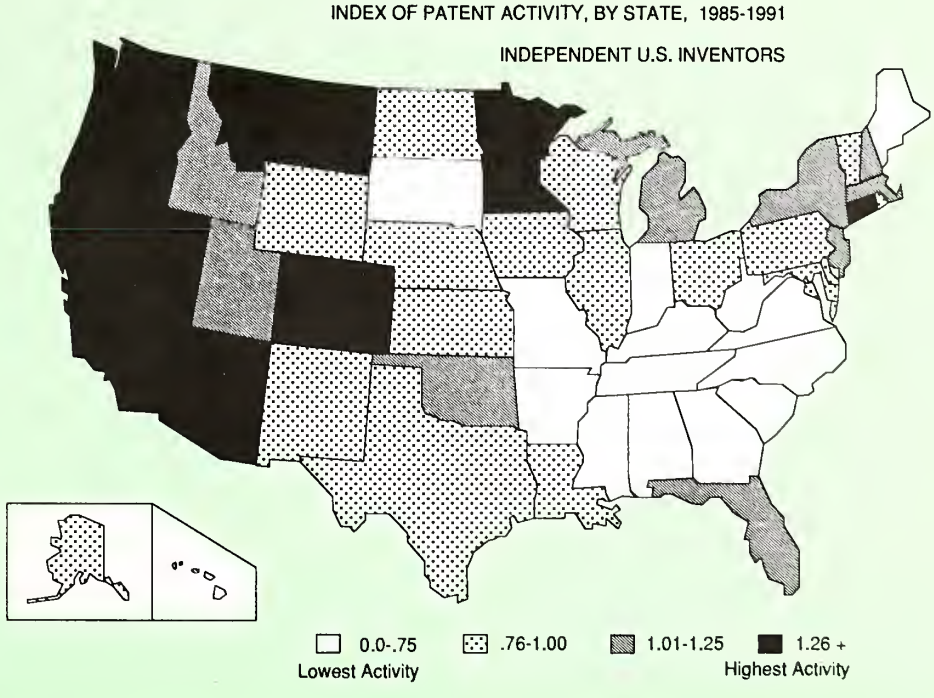
Figure 4.

Index of Inventor Activity by State, Independent U.S. Inventors, 1971-77 and 1985-91

1971-1977



1985-1991



in the northeastern region. In addition to California, 4 other states showed relatively large declines in the concentration of independent inventor activity: Delaware (1.03 to .76); Kansas (.99 to .77); New Jersey (1.46 to 1.25); and Illinois (1.13 to .98).

The concentration of independent inventor activity increased in 36 states, with the largest increases occurring in Montana (.78 to 1.50); New Hampshire (.82 to 1.17); Louisiana (.57 to .84); Idaho (.98 to 1.23); Vermont (.56 to .77); Arizona (1.39 to 1.60); and Washington (1.09 to 1.29).

Trends in Patent Activity--Foreign Inventors Who Patent in the United States

A major factor in the growth of patent activity in the United States has been the steady increase in patenting by inventors who reside in other countries. Today, nearly half of the USPTO patent applications and grants are associated with inventors who reside in other countries, compared to just 30 percent in 1971. This section describes trends in foreign inventor application filings and grants and the geographic distribution of their inventors.

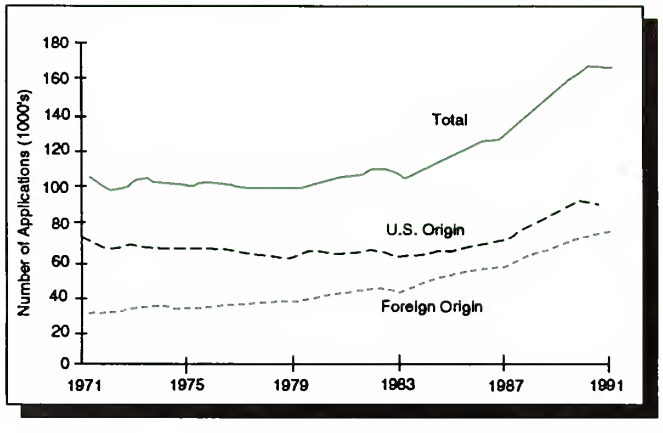
Applications and Grants.

The number of patent applications filed by residents of foreign countries who seek patent protection in the United States has more than doubled in the past 20 years. (See Figure 5.)

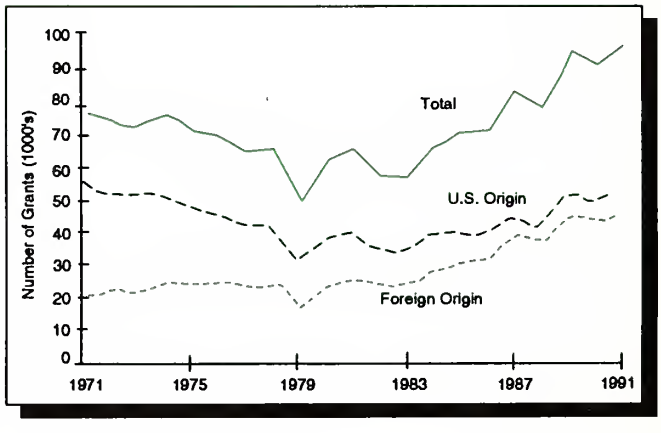
Approximately 33,000 utility patent applications were filed by residents of foreign countries in 1971 and this figure has grown to more than 76,000 applications in 1991. (See Figure 5a.) About 61 percent of applications from foreign sources eventually mature into patent grants (compared to 57 percent of domestic applications).[13]

Figure 5.

Number of Utility Patent Applications (5a) and Patent Grants (5b), U.S.-Resident Inventors and Foreign-Resident Inventors, 1971-1991



(5a) Applications

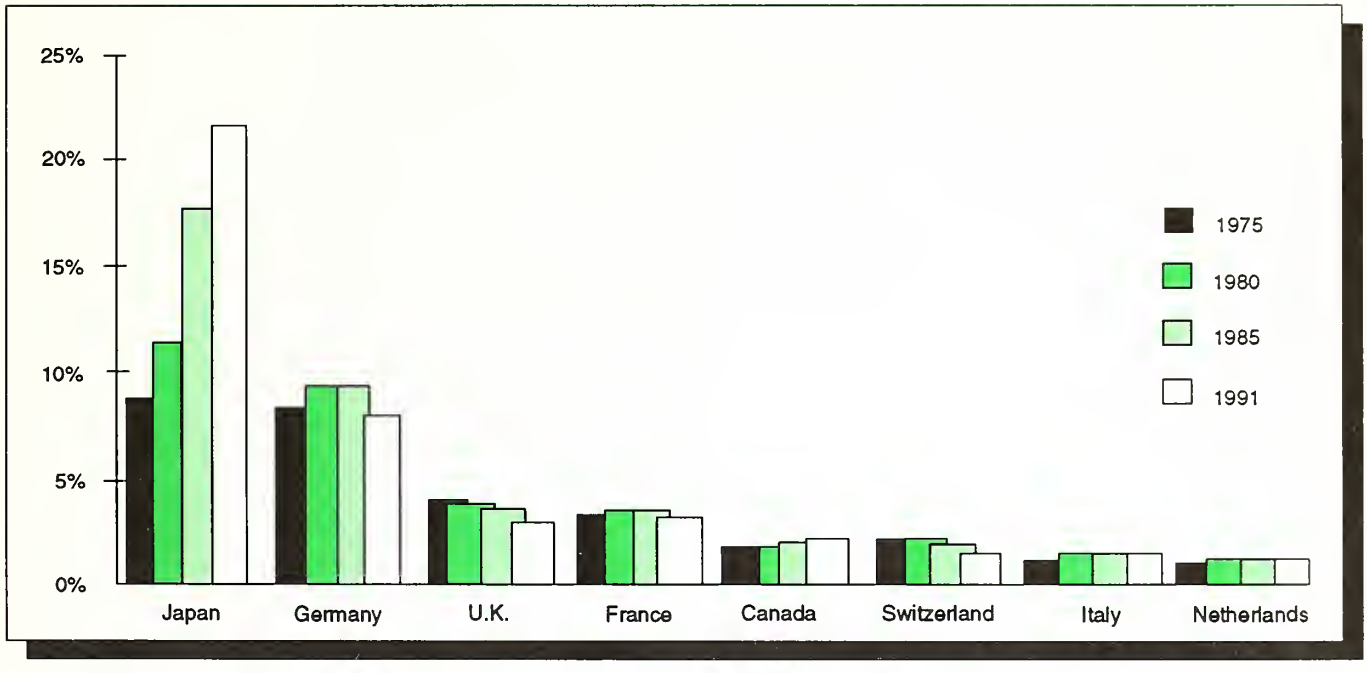


(5b) Grants

[13] Although the overall 'success rate' is about 61 percent, this rate varies by country. Higher success rates are associated with applications from Japan, Germany, France and Sweden; lower success rates are associated with Great Britain, Canada and Italy. Applications from corporations are also more likely to mature into patents than applications from independent inventors. Because foreign patent activity in the United States is predominantly corporate patenting, applications from foreign sources are more likely than applications from domestic sources to mature into patents.

Figure 6.

Distribution of Utility Patent Grants by Foreign Country of Origin (Percent of Total U.S. Grants)



Although the number of applications from foreign sources continues to rise each year, the share of total USPTO application filings that were of foreign origin actually declined from 47 percent in 1987 to 45 percent in 1990. (See Appendix Table A-1) The decline in the proportion of patent applications that were of foreign origin was the result of increased levels of domestic patent activity—yearly increases in the number of applications from U.S.-resident inventors averaged 3.5 percent from 1984 through 1987, then rose to 10.0 percent per year from 1988 through 1990.

The number of patents granted to foreign-resident inventors has been generally increasing since 1971, despite yearly fluctuations in the data. Slightly more than 22,000 patents were granted to foreign-resident inventors in 1971; by 1991, more than 45,000 patents were granted to foreign-resident inventors. (See Figure 5b)

Foreign Ownership.

Since 1988, foreign corporations have received 88 percent of the patents granted to foreign entities each year, compared to 81 percent in 1971. While foreign corporate activity has increased, patent activity by foreign independent inventors has decreased. Foreign independent inventors received 19 percent of patents granted to foreign entities in 1971, but only 11 percent in 1991.

Sources of Foreign Patent Activity in the United States.

Foreign patent activity in the United States has been dominated by Japan, several west European nations and Canada for the past 20 years. While patent activity by these nations continues to be strong in the United States, the increasing economic growth of other nations, particularly in Asia, is evident in their rapidly increasing patent activity in the United States.

The major countries patenting in the United States include Japan, Germany,[14] the United Kingdom, France, Canada, Switzerland, Italy, and the Netherlands. Together, these countries account for more than 90 percent of all foreign patent activity in the United States. Japan, the most active of these nations, accounts for nearly one half of all foreign patent activity in the United States.[15] (See Appendix Tables A-4 and A-5.)

The continued strength and intensity of Japanese patenting in the United States can be seen in the distribution of total U.S. patent grants by country of origin. (See Figure 6). Only 9 percent of U.S. patent grants were of Japanese origin in 1975, but this figure grew to more than 22 percent in 1991. Germany received 8 percent of United States utility patents in 1991, and inventors from all other major patenting countries each received less than 5 percent of U.S. patent grants.

The increase in the share of U.S. patent grants to Japan during the past 20 years is due primarily to a rapid increase in the number of applications received from Japan, rather than to a decrease in the number of applications from other countries. More than 350,000 U.S. patent applications have been filed by Japanese inventors in the United States since 1971. By comparison, Germany has filed 200,000 applications, while other major patenting countries have each filed less than 100,000 applications during the period. Of particular note, Japanese activity continued even during the late 1970's and early 1980's when the number of applications filed by most other nations (including the United States) declined. (See Appendix Table A-5.)

While U.S. patent activity by residents of the major foreign patenting countries remains high, increasing activity by residents of other rapidly developing nations is evident. Applications from South Korea have increased from just 4 in 1971 to more than 1,397 in 1991.[16] During this same time, applications from Taiwan increased from 28 to 2,252. Notable increases in the number of applications from Hong Kong and the People's Republic of China have also occurred.[17]

Political changes in eastern Europe may account for the decrease in the U.S. patent activity of those nations. Since the late 1970's, there has been a steady decline in the number of applications from Czechoslovakia, Romania and Poland. Applications from the U.S.S.R. also declined from 752 applications in 1973 to 145 applications in 1985; following a brief increase in activity between 1986 and 1990, Soviet applications again dropped in 1991.

Technological Emphasis of Patent Activity

The technological emphases of the United States and the three most active foreign patenting countries in the United States (Japan, Germany,[18] and the United Kingdom) have been analyzed. In addition, the technological emphases of South Korea and Taiwan are presented to illustrate technology development within these newly industrialized nations.[19]

Analysis of technological emphasis of patent documents provides useful insight into the economic and technological development within a country. Frequently, the patent technology that is emphasized in a particular country reflects the economic strength of that country; furthermore, it is not unusual to see patent activity in those technologies less emphasized in other countries. This trend is illustrated through a comparison of Country Activity Index values, which measure the relative emphasis of organizational patent activity for each country.[20] (See Appendix Table A-6.)

[14] Pre-1991 data for Germany presented in this section are for West Germany only,

[15] Over 46 percent of foreign applications and 48 percent of foreign patent grants are of Japanese origin.

[16] Over 30 percent of the applications received from South Korea since 1971 were received in 1991.

[17] Applications from Hong Kong increased from 25 in 1971 to 132 in 1991; applications from the People's Republic of China increased from 12 in 1975 to 126 in 1991.

[18] Data in this section were compiled prior to German reunification and are based on West German activity only.

[19] For purposes of this report, "nations" or "countries" may include geopolitical areas that are not universally recognized as sovereign nations.

[20] The United States Patent Classification System is used to categorize the technological content of patent documents. This classification system identifies over 400 broad classes of technology into which the technological content of patent documents can be classified. Although these 400+ classes are subdivided into more than 128,000 smaller subclasses of technology, only the 400+ broader classes are used in the Country Activity Index. The Country Activity Index measures a country's activity within each class by taking the proportion of (utility) patents granted in the class that originated in each country and dividing it by the proportion of all (utility) patents granted in all classes which originated in that country. Only classes for which at least 200 patents were granted in 1990 are included in the index. Activity index values measure patent activity of nongovernmental organizations–United States or foreign (i.e., calculations are based only on patents assigned to nongovernmental, United States or foreign organizations at the time of grant; these patents are predominantly but not exclusively corporate owned patents). The calculation of Country Activity Indexes was originally prepared for the National Science Foundation for inclusion in the *Science & Engineering Indicators* publication.

Figure 7.

Technologies with Greater or Lesser Patenting Emphasis in the United States, by Country of Origin, 1990

U.S. PATENT CLASSIFICATION SYSTEM CLASSES RECEIVING GREATER OR LESSER PATENTING EMPHASIS, FOR U.S. PATENTS ISSUED IN 1990, BY COUNTRY OF ORIGIN. (1)

CLASS	CLASS TITLE (partial)	U.S.	JAPAN	WEST GERMANY	UNITED KINGDOM
208	Mineral Oils: Processes and Products	GREATER	Lesser		
166	Wells	GREATER	Lesser	Lesser	
252	Compositions	GREATER			GREATER
354	Photography	Lesser	GREATER	Lesser	Lesser
355	Photocopying		GREATER	Lesser	Lesser
360	Dynamic Magnetic Information Storage or Retrieval		GREATER		Lesser
369	Dynamic Information Storage or Retrieval	Lesser	GREATER	Lesser	Lesser
365	Static Information Storage and Retrieval		GREATER	Lesser	
400	Typewriting Machines	Lesser	GREATER		
84	Music	Lesser	GREATER	Lesser	Lesser
180	Motor Vehicles	Lesser	GREATER		
346	Recorders		GREATER	Lesser	
123	Internal-Combustion Engines	Lesser	GREATER		
102	Ammunition and Explosives		Lesser	GREATER	
532-570	Organic Compounds-Part of Class 532-570 Series			GREATER	GREATER
71	Chemistry, Fertilizers			GREATER	GREATER
106	Compositions, Coating or Plastic			GREATER	GREATER
244	Aeronautics		Lesser		GREATER
70	Locks	Lesser			Lesser
606	Surgery		Lesser		Lesser
5	Beds	Lesser	Lesser	Lesser	
211	Supports, Racks		Lesser		Lesser
114	Ships	Lesser		Lesser	
119	Animal Husbandry		Lesser	Lesser	Lesser
2	Apparel	Lesser	Lesser	Lesser	
446	Amusement Devices, Toys			Lesser	Lesser
273	Amusement Devices, Games	Lesser		Lesser	Lesser
272	Amusement and Exercising Devices	Lesser	Lesser	Lesser	Lesser
43	Fishing, Trapping and Vermin Destroying	Lesser	Lesser	Lesser	Lesser
4	Baths, Closets, Sinks and Spittoons	Lesser	Lesser	Lesser	Lesser

(1) Relative Magnitude of patent emphasis is based on the Country Activity Index (see Appendix Tables [Classes]). A country's activity index for a class is determined by taking the proportion of (utility) patents granted in the class which originated in the country and dividing it by the proportion of all (utility) patents granted in all classes which originated in that country. Only classes for which at least 200 patents were granted have been included in the calculation of the index.

SOURCE: USPTO/TAF Program Report—Country Activity Index Report, 1990.

A comparison of patent activity by U.S. inventors and Japanese inventors who patent in the United States shows an inverse relationship in technological emphasis. In the United States, patent activity in both 1980 and 1990 showed greater emphasis on crude oil refining processes and products, wells (i.e., the means for increasing well production, especially for oil and natural gas), and chemical technologies. Japanese patent activity in the United States showed lesser emphasis on these technologies. However, technologies more likely to be emphasized in U.S. patents granted to Japanese inventors received lesser U.S. emphasis: motor vehicles; typewriting machines; dynamic information storage or retrieval; photography; and music.

German activity in the United States emphasized ammunition and explosives, and organic compound classes. Patent grants to German inventors have shown less emphasis on technologies emphasized by Japan and the United States, such as wells, music, and information storage and retrieval; within the past 10 years, German emphasis on photography and photocopying technologies (areas of Japanese strength) has declined.

Like the Germans, the British place lesser emphasis on technologies with higher Japanese emphasis in the United States (i.e., photography, photocopying, music and information storage and retrieval classes). The British place greater emphasis in chemical classes (including biochemical, organic compounds, and fertilizers), communications, and industrial based technologies , such as fasteners, pipe joints or couplings, valves and metal founding.

South Korea and Taiwan represent two of the four countries of Asia (the other two being Hong Kong and Singapore) whose share of world production and trade have quadrupled since 1965.[21] The development of technology in South Korea and Taiwan is reflected in their relatively large increases in patent activity in the United States during the past 10 years.

A noteworthy characteristic of South Korean and Taiwanese patent activity is the fact that these countries tend to emphasize technologies that are already emphasized by other nations that patent in the United States. South Korean patent activity in the United States emphasizes a number of high technology classes that also have been emphasized by the Japanese: information storage and retrieval; photography; music; and pictorial communication (television). The South Koreans are also active in other forms of communications, including telecommunications and telephonic communications. This emphasis in communication technology is also emphasized in Taiwanese patent activity in the United States. In addition, the Taiwanese have begun to emphasize other electrical and chemical classes.

Financing the United States Patent System

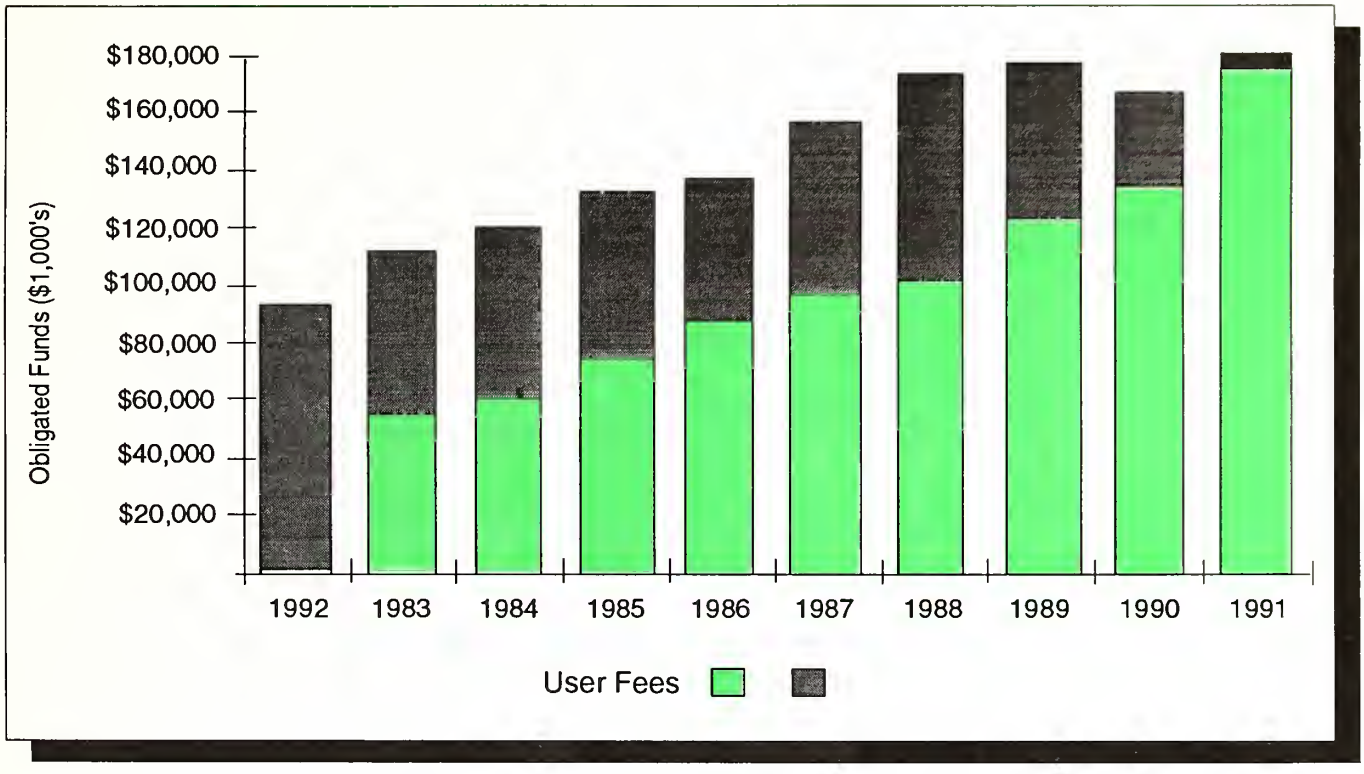
Major changes in the financing of the United States patent system have accompanied the significant growth in patent activity. Today, financial support of the United States patent system relies almost exclusively on "user fees" for application filing, patent issuance, and patent maintenance. Public Law 96-517, enacted in December 1980 (and amended by P.L. 97-247 in August 1982) authorized significant changes to the patent fee structure. Among these changes was an increase in fees charged to patent applicants and grantees to pay the cost of patent processing operations.[22] In addition, USPTO was authorized to implement a patent maintenance fee structure that would provide for continued patent protection for the 17-year life of the patent. This legislation was designed to ensure adequate funding to the USPTO in the absence of additional appropriations. Despite substantial increases in user fees, in recent years, there has not been any sustained, negative impact on patent activity. Being cognizant of these higher costs to the users, the USPTO has nonetheless provided quality service through this period of increased costs by maintaining the average length of time required to examine a patent application between 18 and 19 months. Furthermore, the cost of obtaining and maintaining a patent in the United States continues

[21] World Resources Institute, *World Resources 1992-93*, (Oxford University Press, New York, 1992), p. 42.

[22] Prior to enactment of this legislation, the USPTO did not directly benefit from the collection of user fees, since this revenue was deposited into the general fund of the United States Treasury.

Figure 8.

USPTO Operating Budget
Obligated Funds for Patent Processing Activities (in Constant 1987 Dollars), by Funding Source, Fiscal Years 1982-1991



to be most favorable when compared to costs in other major patenting countries.

Patent Operating Costs.

The increase in patent application filings and grants in recent years has been accompanied by a similar increase in the USPTO operating budget (obligations) for patent processing activities.[23] Between FY 1982 and FY 1991, the actual fees and appropriated funds required for the direct costs of patent processing increased from $78 million to $208 million. When adjusted for inflation, this represents an increase from $92 million to $178 million, based on constant 1987 dollars (See Figure 8.) This increase has been commensurate with increases in the patent workload. The ratio between total operating budget for patent processing (adjusted for inflation) and the number of applications filed has been about $1,000 per application (in constant 1987 dollars) since FY 1983. The ratio between operating budget for patent processing (adjusted for inflation) and patent grants has also been fairly stable at about $1,700 since FY 1983. (See Figure 9.)

[23] Patent processing includes activities associated with the processing of applications, grants and post-grant activities; also included are patent automation activities. Specifically excluded from patent processing activity are trademark processing, information dissemination, and executive direction and administration.

Figure 9.

Ratio of the USPTO Total Obligated Funds for Patent Processing (in Constant 1987 Dollars) to the Number of Patent Applications and Grants, Fiscal Years 1982-1991

	Total Obligated Funds:	
Fiscal Year	Per Application	Per Patent
1982	$748	$1,432
1983	$1,042	$1,844
1984	$1,017	$1,664
1985	$1,040	$1,739
1986	$1,037	$1,769
1987	$1,126	$1,740
1988	$1,152	$2,042
1989	$1,071	$1,703
1990	$940	$1,697
1991	$1,001	$1,750

Includes Utility, Design, Plant and Reissue Patents

Today, USPTO patent processing activities are entirely user-fee funded. The Omnibus Reconciliation Act of 1990 directed an increase in patent statutory fees by 69 percent. This increase essentially replaces General Fund (taxpayer) support. In FY 1991, 98 percent of the patent processing budget was user-fee funded, compared to 51 percent in FY 1983.[24]

Patent Application Filing and Issue Fees.

The cost to obtain a U.S. patent has increased several times between since FY 1983—the first increase was in FY 1986 and other increases followed in FY 1989, 1991 and 1992. In actual dollars, the basic utility patent application fee plus issue fee has increased from $400 to $910 for small entities, and from $800 to $1,820 for large entities. [25] When adjusted for inflation (based on 1987 dollars) small entity costs increased from $459 to $752 and large entity costs increased from $917 to $1,505.

The application filing fee increases since FY 1983 do not appear to have had a long-term negative impact on application filing rates of U.S. inventors. The per capita filing rate of large entities increased 40 percent between 1983 and 1991; for small entities, the per capita filing rate increase was 70 percent. In 1991, the per capita filing rate of large entities reached 20 applications per 100,000 U.S. population and the filing rate of small entities reached 16 applications per 100,000 U.S. population[26] (See Figure 10).

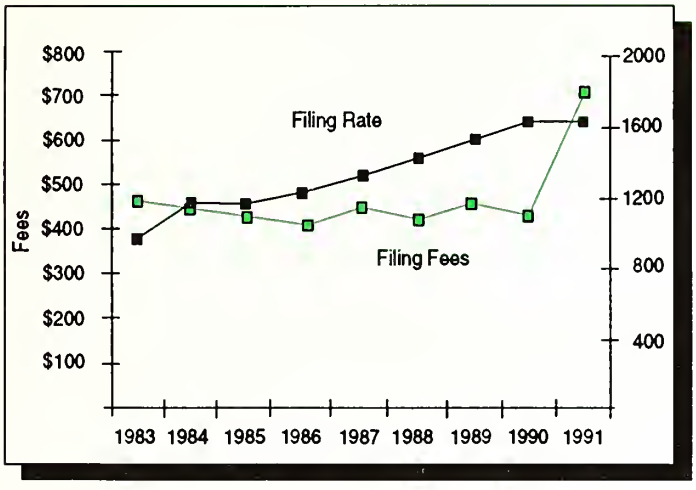
[24] Prior to 1983 all fee collections except patent reexamination fees were returned to the U.S. Treasury and not retained by the USPTO.

[25] Between 1965 and 1983, all utility patent applicants paid a basic filing plus issue fee of $165. A major increase in application fees was implemented in 1983, at which time separate fee schedules for large and small entities were also established. Small entities consist of independent inventors, small businesses with less than 500 employees and non-profit organizations.

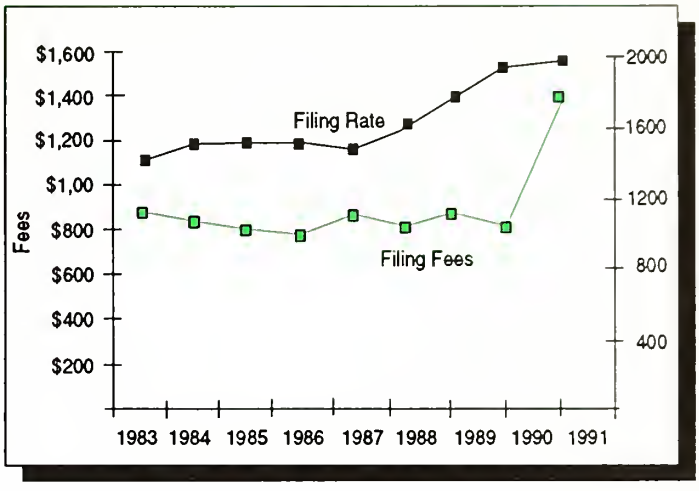
[26] Calculations of per capita filing rates are based on estimates of the proportion of all patent applications that were for inventions (i.e., utility patents).

Figure 10.

Small Entity Filing Fees (10a) and Large Entity Filing Fees (10b) (in Constant 1987 Dollars), versus Per Capita Filing Rates, FY 1983-91



(10a) Small Entities



(10b) Large Entities

Maintenance Fees.

In addition to higher user fees, the Congressional legislation of 1980 and 1982 authorized USPTO to implement a maintenance fee system for utility patents, similar to the fee systems that have been in place in many other industrialized nations. Under this system, the owners of U.S. patents filed after December 1980 must pay a fee periodically to maintain patent protection throughout the 17-year life of the patent. Maintenance fees are due at 3.5, 7.5, and 11.5 years following the date of patent issue; patents are subject to expiration if fees are not received within six months following the due date. Maintenance fees are lower for small entities than large entities; fees for small entities in 1992 were $450, $905, and $1,365 (in actual dollars), due at 3.5, 7.5 and 11.5 years respectively. Maintenance fees for larger entities are twice those of small entities.

Data on four year expirations are available for patents issued between 1981 and 1987, and on eight year expirations for patents issued between 1981 and 1982. (See Appendix Tables A-7 and A-8.) Despite the limited availability of data and the relatively recent implementation of the maintenance fee system, trends in maintenance fee expirations are evident.

Approximately 17 percent of eligible patents expire at four years and additional 24 percent *of those that remain* expire at eight years for nonpayment of maintenance fees. For patents that issued between 1981 and 1982 and were subject to both four year and eight year maintenance fees, 63 percent were still in force after eight years. (See Figure 11.)

The importance of patent protection in the United States to Japanese inventors is reflected in the fact that the Japanese are most likely to pay four-year and eight-year maintenance fees. Only 6 percent of U.S. patents issued to Japanese inventors are allowed by their owners to expire in four years, compared to 17 percent or more for each of the other major patenting countries. At eight years, the Japanese expiration rate rises to 13 percent of patents eligible to expire, compared to 24 percent or more for each of the other major patenting countries. (See Figure 12.)

The low expiration rate of patents owned by Japanese suggests their owners consider these to be particularly valuable in the United States. The decision to maintain patent protection can be interpreted as an indication that the value of the patent exceeds the cost of maintaining the patent protection. If the invention becomes obsolete or finan-

Figure 11.

Utility Patent Grants Expired Due to Non-payment of Maintenance Fees, Grants Issued 1981-83

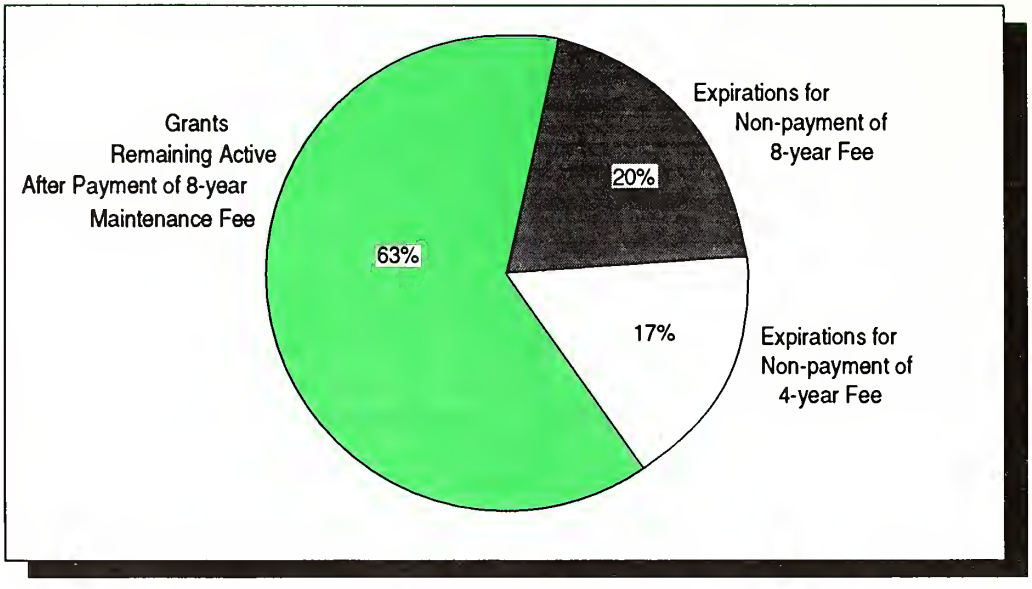
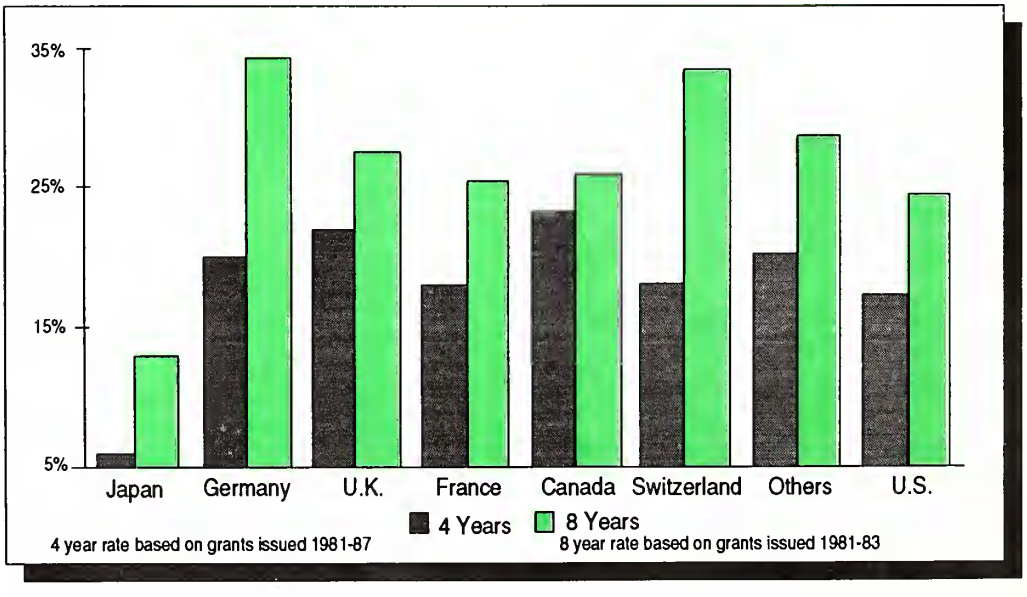


Figure 12.

Maintenance Fee Expirations, by Country of Origin

Percent of Total Number Eligible to Expire



cially unprofitable, it is reasonable to assume the patent would be allowed to expire.

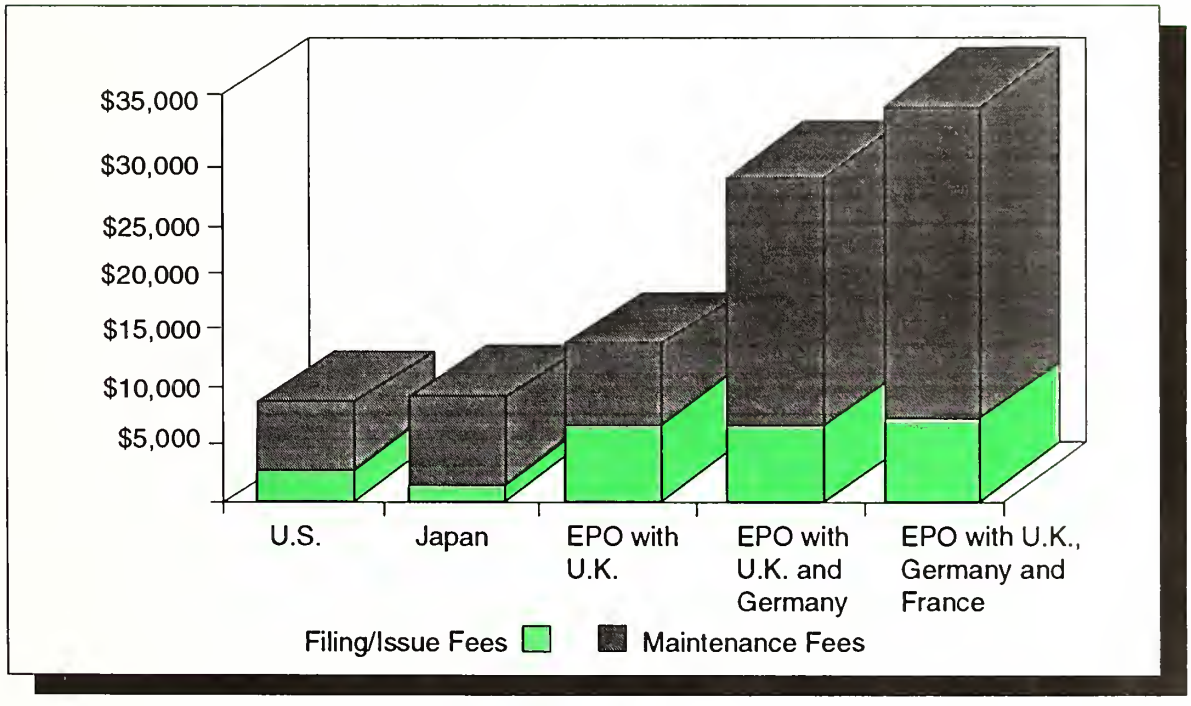
Comparative Cost of Patenting in the United States, Europe and Japan.

Patenting costs in the United States continue to compare favorably to costs in other major patenting countries. This is despite an increase in user fees scheduled to go into effect at USPTO on October 1, 1992. At that time, large entity filing/issue fees and maintenance fees will increase to $1,880 and $5,620, respectively–small entity fees will continue to be half the fees charged to large entities.

Figure 13 presents a comparison of patent fees at the USPTO, the Japanese Patent Office (JPO) and the European Patent Office (EPO)[27], effective October 1992.[28] The total basic fee for a patent with 3 claims is approximately the same in the United States, and Japan–$7,500 and $7,866, respectively–but considerably lower than fees at EPO. Total basic fees for an EPO patent are based on the number of designated countries and which countries are designated (maintenance fees are based on the fee structure established by each national office). For example, total basic fees at EPO for a patent with only the United Kingdom designated are $12,883, compared to $21,685 for a patent with only Germany designated.

Figure 13.

A Comparison of Utility Patent Fees (with 3 Claims) , United States Patent Office, Japanese Patent Office, and the European Patent Office, Fees in Effect October 1, 1992



[27] European inventors can obtain patent protection in their country of residence, plus other European countries, by filing an application with each national patent office, or by filing an application with the European Patent Office and designating specific countries. EPO patent grants are essentially a portfolio of national grants. The EPO was established through the European Patent Convention, signed in Munich in 1973 and entered into force in 1977. Typically, the cost of obtaining patent protection in three countries through the EPO is less than the cost of obtaining three national patents (before representation–before EPO or the national patent offices–and translation).

[28] Data in Figure 13 reflect USPTO and EPO fee amounts that go into effect on October 1, 1992. European maintenance fees reflect maintenance fee charges through December 1991. JPO fees reflect the schedule as of January 29, 1992. Fees are expressed in U.S. dollars (rounded to the nearest dollar) and are based on exchange rates published September 1, 1992).

In Figure 13, representative costs for an EPO patent with one, two, and three countries are shown. The total basic fees for an EPO patent with only the United Kingdom designated are $12,883; with both the United Kingdom and Germany designated–$28,929; and with the United Kingdom, Germany and France designated–$34,218.

Summary

In summary, trends in patent activity during the past two decades point to the success of the United States patent system in promoting technological development and disseminating new technology, both at home and abroad. The importance of the U.S. patent system to U.S. inventors is reflected in the dramatic rise in patent activity by U.S. residents, especially in the last 10 years. Trends in patent activity also point to the increasingly international character of patent activity in the United States. The fact that nearly half of all utility patents are now granted to foreign inventors is a testament to increasing levels of inventiveness abroad and to the importance of international trade, rather than a decline in U.S. inventiveness.

Appendix
Tables

Table A-1. UTILITY PATENT APPLICATIONS FILED AND GRANTS ISSUED, BY U.S. AND FOREIGN ORIGIN, 1971-1991

YEAR	U.S. POPULATION (1000's)	UTILITY APPLICATIONS BY U.S/FOREIGN ORIGIN				U.S. APPLICATIONS PER 100,000 POPULATION	UTILITY GRANTS ISSUED BY U.S/FOREIGN ORIGIN				U.S.GRANTS PER 100,000 POPULATION
		U.S.	FOREIGN	TOTAL	PERCENT FOREIGN		U.S.	FOREIGN	TOTAL	PERCENT FOREIGN	
1971	207661	71089	33640	104729	32%	34.23	55984	22333	78317	29%	26.96
1972	209896	65943	33355	99298	34%	31.42	51524	23286	74810	31%	24.55
1973	211909	66935	37144	104079	36%	31.59	51504	22639	74143	31%	24.30
1974	213854	64093	38445	102538	37%	29.97	50650	25628	76278	34%	23.68
1975	215973	64445	36569	101014	36%	29.84	46717	25285	72002	35%	21.63
1976	218035	65050	37294	102344	36%	29.83	44280	25946	70226	37%	20.31
1977	220239	62863	38068	100931	38%	28.54	41485	23784	65269	36%	18.84
1978	222585	61441	39475	100916	39%	27.60	41254	24848	66102	38%	18.53
1979	225055	60535	39959	100494	40%	26.90	30081	18775	48856	38%	13.37
1980	227757	62098	42231	104329	40%	27.27	37356	24463	61819	40%	16.40
1981	230138	62404	44009	106413	41%	27.12	39223	26548	65771	40%	17.04
1982	232520	63316	46309	109625	42%	27.23	33896	23992	57888	41%	14.58
1983	234799	59390	44313	103703	43%	25.29	32871	23989	56860	42%	14.00
1984	237001	61841	49443	111284	44%	26.09	38366	28834	67200	43%	16.19
1985	239279	63874	53132	117006	45%	26.69	39555	32106	71661	45%	16.53
1986	241625	65487	56946	122433	47%	27.10	38126	32734	70860	46%	15.78
1987	243942	68315	59602	127917	47%	28.00	43519	39433	82952	48%	17.84
1988	246307	75192	64633	139825	46%	30.53	40496	37428	77924	48%	16.44
1989	248762	82370	70380	152750	46%	33.11	50185	45354	95539	47%	20.17
1990	251394	90643	73915	164558	45%	36.06	47393	42971	90364	48%	18.85
1991	252688	87955	76351	164306	46%	34.81	51176	45338	96514	47%	20.25

U.S. Population includes Armed Forces overseas.

SOURCE: for U.S. Population, Bureau of the Census; for Applications, USPTO submissions to WIPO; for Grants, USPTO/TAF Data Base.

Table A-2. UTILITY PATENT GRANTS ISSUED, BY OWNERSHIP TYPE, NUMBER AND PERCENT 1971-1991

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
TOTAL	78317	74810	74143	76278	72002	70226	65269	66102	48854	61819	65771	57888	56860	67200	71661	70860	82952	77924	95539	90364	96514
U.S. ORIGIN	55984	51524	51504	50650	46717	44280	41485	41254	30081	37356	39223	33896	32871	38366	39555	38126	43519	40496	50185	47393	51176
Corporation Owned	41275	38196	37089	36379	33646	32384	29752	29622	21315	26184	27865	24354	24269	28256	29186	27656	31679	29668	36297	33894	36806
Government Owned	2124	1759	2069	1715	1888	1813	1484	1233	960	1232	1115	1003	1041	1224	1124	1009	971	726	869	978	1177
Individual Owned (Independent Inventors)	12585	11569	12346	12556	11183	10083	10249	10399	7806	9940	10243	8539	7561	8886	9245	9461	10869	10102	13019	12521	13193
FOREIGN ORIGIN	22333	23286	22639	25628	25285	25946	23784	24848	18773	24463	26548	23992	23989	28834	32106	32734	39433	37428	45354	42971	45338
Corporation Owned	18033	18825	18388	20687	20798	21808	19848	20837	15810	20359	22388	20304	20679	25019	27991	28418	34452	32763	39903	37780	39945
Government Owned	139	110	141	187	193	209	216	249	186	253	249	368	336	437	481	478	551	451	440	419	468
Individual Owned (Independent Inventors)	4161	4351	4110	4754	4294	3929	3720	3762	2777	3851	3911	3320	2974	3378	3634	3838	4430	4214	5011	4772	4925
U.S. ORIGIN	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Corporation Owned	74%	74%	72%	72%	72%	73%	72%	72%	71%	70%	71%	72%	74%	74%	74%	73%	73%	73%	72%	72%	72%
Government Owned	4%	3%	4%	3%	4%	4%	4%	3%	3%	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%
Individual Owned (Independent Inventors)	22%	22%	24%	25%	24%	23%	25%	25%	26%	27%	26%	25%	23%	23%	23%	25%	25%	25%	26%	26%	26%
FOREIGN ORIGIN	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Corporation Owned	81%	81%	81%	81%	82%	84%	83%	84%	84%	83%	84%	85%	86%	87%	87%	87%	87%	88%	88%	88%	88%
Government Owned	1%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	1%	2%	1%	1%	1%	1%	1%	1%	1%
Individual Owned (Independent Inventors)	19%	19%	18%	19%	17%	15%	16%	15%	15%	16%	15%	14%	12%	12%	11%	12%	11%	11%	11%	11%	11%

SOURCE: USPTO/TAF Data Base; All Technologies Report, March 1992.

Table A-3. INDEX OF UTILITY PATENT ACTIVITY BY STATE, ALL U.S. INVENTORS AND INDEPENDENT INVENTORS 1971-1991. (U.S. Average = 1.00)

REGION AND STATE	1971-1977		1978-1984		1985-1991	
	All U.S. Inventors (1)	Independent Inventors (2)	All U.S. Inventors	Independent Inventors	All U.S. Inventors	Independent Inventors
Northeast						
Connecticut	2.25	1.50	2.31	1.40	2.38	1.54
Maine	0.27	0.46	0.38	0.61	0.40	0.55
Massachusetts	1.61	1.14	1.66	1.27	1.67	1.19
New Hampshire	0.91	0.82	1.10	1.00	1.32	1.17
New Jersey	2.38	1.46	2.46	1.33	2.09	1.25
New York	1.21	1.16	1.14	1.08	1.15	1.06
Pennsylvania	1.30	0.84	1.30	0.80	1.21	0.78
Rhode Island	0.84	0.75	0.71	0.77	0.75	0.89
Vermont	0.78	0.56	0.79	0.77	1.00	0.77
North Central						
Illinois	1.50	1.13	1.40	1.05	1.25	0.98
Indiana	0.94	0.70	1.02	0.74	0.94	0.64
Iowa	0.62	0.75	0.65	0.70	0.69	0.77
Kansas	0.57	0.99	0.56	0.90	0.50	0.77
Michigan	1.32	1.10	1.37	1.20	1.41	1.21
Minnesota	1.08	1.13	1.25	1.09	1.50	1.28
Missouri	0.84	0.65	0.68	0.69	0.61	0.69
Nebraska	0.34	0.81	0.42	0.89	0.44	0.91
North Dakota	0.27	0.71	0.30	0.69	0.37	0.86
Ohio	1.27	0.92	1.26	0.87	1.21	0.80
South Dakota	0.27	0.64	0.25	0.55	0.26	0.64
Wisconsin	0.96	0.86	0.96	0.74	1.10	0.90
South						
Alabama	0.29	0.37	0.29	0.36	0.38	0.43
Arkansas	0.18	0.39	0.20	0.37	0.21	0.41
Delaware	3.82	1.03	2.98	0.79	3.11	0.76
District of Columbia	0.57	0.98	0.44	1.17	0.40	0.88
Florida	0.53	1.07	0.58	1.14	0.64	1.15
Georgia	0.29	0.50	0.38	0.55	0.45	0.57
Kentucky	0.39	0.31	0.43	0.40	0.40	0.43
Louisiana	0.41	0.57	0.43	0.68	0.53	0.84
Maryland	1.03	1.10	1.00	1.25	0.88	1.00
Mississippi	0.15	0.31	0.15	0.27	0.19	0.36
North Carolina	0.42	0.43	0.47	0.51	0.58	0.61
Oklahoma	1.14	1.09	1.21	1.07	1.04	1.12
South Carolina	0.39	0.41	0.48	0.54	0.53	0.60
Tennessee	0.38	0.39	0.48	0.48	0.49	0.56
Texas	0.72	0.83	0.80	0.81	0.90	0.83
Virginia	0.59	0.67	0.59	0.76	0.58	0.73
West Virginia	0.34	0.31	0.46	0.35	0.41	0.39
West						
Alaska	0.29	0.74	0.24	0.77	0.29	0.84
Arizona	0.84	1.39	0.98	1.60	1.07	1.60
California	1.33	1.85	1.27	1.75	1.26	1.57
Hawaii	0.21	0.57	0.20	0.59	0.26	0.74
Idaho	0.43	0.98	0.45	1.07	0.65	1.23
Montana	0.28	0.78	0.36	1.02	0.47	1.50
Nevada	0.56	1.25	0.68	1.79	0.48	1.26
New Mexico	0.44	0.77	0.48	0.84	0.64	0.89
Oregon	0.65	1.45	0.68	1.41	0.97	1.47
Utah	0.79	1.32	0.79	1.32	0.92	1.24
Washington	0.62	1.09	0.72	1.08	0.88	1.29
Wyoming	0.42	1.00	0.39	0.93	0.39	0.94

Index values compare the distribution of patents to the distribution of population. Index is less than 1.00 if the state has disproportionately fewer grants per capita, compared to other states, and greater than 1.00 if the state has disproportionately more patent grants per capita. For example, an index value would equal .50 if the state has 10 percent of the patent grants, but 20 percent of the total population.

(1) Grants issued to All U.S. Inventors includes corporations, governments, institutions and individuals. State assignment is based on the residence of the first-named inventor.

(2) Grants issued to independent inventors were unassigned at issue or assigned to an individual. State assignment is based on the residence of the first-named inventor.

Table A-3 (continued). INDEX OF UTILITY PATENT ACTIVITY, BY STATE, INDEPENDENT INVENTORS ONLY, 1971-1991

STATE	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Alabama	0.42	0.44	0.41	0.38	0.26	0.34	0.34	0.36	0.34	0.34	0.38	0.32	0.43	0.33	0.33	0.37	0.38	0.47	0.43	0.48	0.57
Alaska	0.78	0.73	0.83	0.60	0.92	0.43	0.91	1.06	0.71	0.96	0.76	0.91	0.64	0.37	0.94	1.01	0.51	0.56	0.87	0.79	1.21
Arizona	1.23	1.23	1.45	1.55	1.51	1.46	1.33	1.39	1.37	1.84	1.70	1.65	1.60	1.66	1.49	1.65	1.70	1.84	1.67	1.31	1.54
Arkansas	0.38	0.39	0.29	0.33	0.28	0.46	0.56	0.50	0.38	0.31	0.41	0.29	0.43	0.31	0.32	0.35	0.33	0.42	0.41	0.58	0.44
California	1.83	1.76	1.89	1.84	1.87	1.90	1.90	1.82	1.87	1.78	1.71	1.71	1.72	1.62	1.61	1.55	1.61	1.63	1.59	1.50	1.50
Colorado	1.32	1.05	1.22	1.28	1.22	1.26	1.28	1.31	1.45	1.28	1.28	1.30	1.06	1.16	1.21	1.23	1.27	1.45	1.48	1.60	1.46
Connecticut	1.47	1.53	1.51	1.52	1.65	1.37	1.45	1.27	1.59	1.18	1.43	1.42	1.39	1.55	1.74	1.42	1.44	1.57	1.41	1.56	1.60
Delaware	0.79	1.55	0.71	1.43	0.95	1.06	0.69	0.65	0.29	1.04	0.94	0.90	0.66	1.04	0.70	0.52	0.86	0.70	0.68	0.90	0.96
District of Columbia	1.12	0.63	0.89	0.88	1.06	1.37	0.92	1.19	1.37	1.22	0.89	1.52	1.14	0.90	1.28	0.73	0.94	0.83	0.73	0.79	0.86
Florida	1.02	1.05	1.01	1.06	1.07	1.03	1.23	1.14	1.16	1.31	1.27	0.96	1.08	1.04	1.10	1.13	1.14	1.25	1.18	1.14	1.11
Georgia	0.54	0.38	0.61	0.45	0.52	0.51	0.47	0.61	0.45	0.55	0.59	0.62	0.49	0.54	0.54	0.61	0.54	0.50	0.50	0.67	0.60
Hawaii	0.55	0.39	0.46	0.61	0.96	0.55	0.44	0.60	0.57	0.59	0.60	0.55	0.64	0.62	0.52	0.79	0.54	0.84	0.74	0.95	0.78
Idaho	0.85	0.95	1.34	0.80	1.11	0.76	1.05	0.84	1.30	1.21	1.26	1.06	1.00	0.80	0.90	1.32	0.92	1.02	1.75	1.46	1.23
Illinois	1.09	1.15	1.21	1.18	1.05	1.11	1.13	1.09	1.12	1.01	1.00	1.04	0.99	1.13	1.00	1.04	0.98	0.96	1.00	0.94	0.95
Indiana	0.71	0.78	0.66	0.73	0.74	0.66	0.62	0.80	0.69	0.69	0.76	0.75	0.82	0.63	0.70	0.69	0.62	0.67	0.60	0.58	0.60
Iowa	0.80	0.82	0.72	0.71	0.66	0.75	0.82	0.60	0.70	0.71	0.78	0.66	0.67	0.80	0.74	0.83	0.76	0.91	0.83	0.67	0.68
Kansas	0.94	0.91	0.96	1.08	1.11	0.94	0.99	1.16	1.02	0.98	0.66	0.80	0.77	0.92	0.79	0.66	0.72	0.74	0.86	0.79	0.79
Kentucky	0.30	0.28	0.29	0.31	0.40	0.29	0.32	0.45	0.38	0.40	0.40	0.36	0.37	0.47	0.44	0.46	0.37	0.37	0.46	0.42	0.46
Louisiana	0.55	0.53	0.50	0.59	0.60	0.66	0.59	0.70	0.61	0.66	0.57	0.65	0.80	0.81	0.75	0.83	0.85	0.88	0.78	0.90	0.85
Maine	0.44	0.60	0.39	0.59	0.32	0.44	0.43	0.65	0.69	0.47	0.65	0.55	0.70	0.55	0.58	0.44	0.68	0.61	0.64	0.53	0.39
Maryland	1.18	0.98	0.98	1.10	1.15	1.23	1.07	1.10	1.18	1.21	1.37	1.32	1.40	1.18	1.15	0.93	1.03	1.03	1.09	0.90	0.87
Massachusetts	1.13	1.27	1.08	1.16	1.03	1.23	1.12	1.28	1.35	1.20	1.28	1.34	1.18	1.23	1.20	1.24	1.17	1.20	1.18	1.20	1.14
Michigan	1.07	1.13	1.17	1.03	1.05	1.12	1.15	1.11	1.17	1.20	1.18	1.20	1.31	1.21	1.28	1.29	1.10	1.18	1.16	1.22	1.28
Minnesota	1.13	1.16	1.00	1.20	1.23	1.06	1.14	1.10	1.14	1.11	1.05	0.98	1.10	1.18	1.32	1.11	1.33	1.27	1.30	1.29	1.31
Mississippi	0.25	0.21	0.28	0.41	0.42	0.29	0.28	0.27	0.25	0.24	0.34	0.19	0.29	0.31	0.24	0.30	0.32	0.51	0.35	0.50	0.30
Missouri	0.69	0.58	0.63	0.61	0.63	0.72	0.71	0.66	0.62	0.76	0.74	0.76	0.61	0.70	0.68	0.68	0.69	0.60	0.74	0.73	0.74
Montana	0.69	0.76	0.71	0.85	1.08	0.66	0.70	0.98	1.02	1.30	1.41	0.68	0.72	1.00	1.57	1.37	1.86	1.21	1.59	1.37	1.49
Nebraska	1.10	0.69	0.77	0.71	0.86	0.74	0.80	0.93	0.97	0.60	1.01	0.74	0.99	1.03	0.84	1.18	0.82	0.94	0.83	0.89	0.86
Nevada	1.27	0.76	0.69	1.25	1.52	1.67	1.61	1.96	1.85	1.63	1.33	1.80	2.39	1.60	1.10	1.16	1.25	1.22	1.37	1.11	1.58
New Hampshire	0.69	0.67	0.86	0.75	1.25	0.59	0.91	0.86	0.57	0.97	1.08	1.21	1.26	1.09	1.19	1.22	0.93	1.17	1.10	1.40	1.19
New Jersey	1.44	1.64	1.38	1.44	1.38	1.41	1.53	1.40	1.27	1.32	1.35	1.28	1.34	1.33	1.28	1.34	1.29	1.23	1.30	1.12	1.17
New Mexico	0.67	0.79	0.77	0.72	0.76	0.78	0.88	0.86	0.65	0.89	0.71	0.79	1.04	0.92	0.84	0.93	1.15	0.87	0.85	0.76	0.85
New York	1.18	1.14	1.16	1.17	1.10	1.20	1.16	1.16	1.03	1.10	1.09	1.06	1.04	1.09	1.01	1.13	1.06	0.99	1.03	1.08	1.11
North Carolina	0.41	0.43	0.40	0.33	0.49	0.47	0.47	0.51	0.46	0.55	0.54	0.48	0.55	0.51	0.59	0.62	0.60	0.63	0.64	0.56	0.66
North Dakota	0.92	0.66	0.73	0.83	0.46	0.53	0.83	0.82	0.53	0.66	0.71	0.65	0.64	0.81	0.64	1.20	1.00	0.84	0.90	0.62	0.81
Ohio	1.00	1.05	0.96	0.94	0.89	0.84	0.78	0.81	0.92	0.83	0.82	0.92	0.89	0.88	0.96	0.85	0.80	0.80	0.70	0.77	0.74
Oklahoma	1.41	1.14	1.02	1.08	1.11	1.06	0.82	0.98	0.93	1.17	1.08	1.21	0.98	1.15	1.30	1.08	1.08	1.00	1.00	1.23	1.11
Oregon	1.61	1.34	1.62	1.48	1.36	1.33	1.39	1.47	1.39	1.37	1.52	1.28	1.20	1.61	1.37	1.67	1.63	1.38	1.47	1.45	1.29
Pennsylvania	0.76	0.88	0.85	0.89	0.86	0.80	0.84	0.81	0.77	0.77	0.78	0.82	0.80	0.87	0.77	0.81	0.83	0.75	0.77	0.83	0.73
Rhode Island	0.82	0.87	0.68	0.81	0.76	0.94	0.79	0.85	0.70	0.85	0.75	0.86	0.84	0.72	0.88	0.92	0.70	0.78	1.17	0.71	1.07
South Carolina	0.45	0.45	0.38	0.29	0.44	0.37	0.46	0.53	0.40	0.56	0.59	0.58	0.58	0.53	0.64	0.52	0.58	0.57	0.81	0.87	0.60
South Dakota	0.81	0.53	0.53	0.85	0.59	0.69	0.50	0.47	0.50	0.46	0.39	1.06	0.58	0.38	0.91	0.76	0.76	0.75	0.43	0.54	0.35
Tennessee	0.35	0.34	0.46	0.34	0.40	0.42	0.41	0.33	0.42	0.45	0.51	0.52	0.85	0.49	0.51	0.52	0.49	0.57	0.57	0.65	0.58
Texas	0.78	0.86	0.82	0.86	0.89	0.82	0.79	0.79	0.82	0.79	0.78	0.87	0.81	0.82	0.82	0.79	0.87	0.84	0.83	0.84	0.86
Utah	1.25	1.32	1.17	1.39	1.31	1.54	1.24	1.08	1.50	1.36	1.45	1.31	1.01	1.54	1.12	1.04	1.17	1.19	1.27	1.27	1.58
Vermont	0.62	0.47	0.55	0.50	0.52	0.87	0.61	1.29	0.80	0.58	0.74	0.57	0.53	0.90	0.82	0.57	0.98	0.61	0.67	1.09	0.81
Virginia	0.60	0.72	0.85	0.59	0.84	0.73	0.74	0.69	0.69	0.70	0.75	0.84	0.86	0.79	0.86	0.63	0.73	0.63	0.71	0.81	0.77
Washington	1.17	0.99	1.23	1.00	1.11	1.05	1.10	1.07	1.09	1.10	1.05	1.12	1.20	0.93	1.34	1.31	1.25	1.31	1.26	1.27	1.27
West Virginia	0.25	0.28	0.31	0.31	0.35	0.38	0.30	0.24	0.46	0.30	0.32	0.42	0.36	0.35	0.44	0.39	0.39	0.43	0.39	0.38	0.33
Wisconsin	0.93	1.00	0.93	0.84	0.85	0.70	0.74	0.85	0.79	0.76	0.60	0.82	0.71	0.84	0.81	0.86	1.03	0.91	0.87	0.90	0.93
Wyoming	1.02	0.94	0.87	1.12	1.01	1.31	0.78	1.04	1.02	0.82	1.09	0.69	0.90	0.94	0.81	1.56	1.05	0.66	0.64	0.70	1.33

Table A-3 (continued). INDEX OF UTILITY PATENT ACTIVITY, BY STATE, ALL U.S. INVENTORS, 1971-1991

STATE	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Alabama	0.33	0.25	0.33	0.29	0.27	0.30	0.27	0.26	0.27	0.29	0.29	0.28	0.32	0.28	0.39	0.41	0.36	0.35	0.36	0.40	0.38
Alaska	0.32	0.29	0.29	0.36	0.31	0.17	0.29	0.28	0.32	0.30	0.25	0.25	0.18	0.13	0.28	0.31	0.21	0.21	0.36	0.30	0.39
Arizona	0.74	0.79	0.91	0.83	0.87	0.88	0.89	0.94	0.88	0.98	0.97	0.99	1.14	0.98	1.04	1.17	1.11	1.12	1.04	0.95	1.09
Arkansas	0.18	0.16	0.14	0.20	0.15	0.21	0.24	0.21	0.19	0.19	0.19	0.20	0.21	0.17	0.16	0.18	0.17	0.21	0.21	0.28	0.23
California	1.33	1.29	1.39	1.30	1.33	1.34	1.35	1.30	1.34	1.30	1.25	1.26	1.25	1.20	1.22	1.23	1.28	1.30	1.29	1.22	1.25
Colorado	0.82	0.84	0.97	0.95	0.97	0.98	1.04	1.03	1.10	1.00	1.02	1.00	0.97	1.00	1.00	0.99	1.09	1.13	1.18	1.19	1.11
Connecticut	2.20	2.12	2.21	2.21	2.29	2.42	2.26	2.18	2.40	2.10	2.32	2.31	2.41	2.48	2.50	2.56	2.43	2.53	2.39	2.17	2.10
Delaware	3.35	4.98	3.82	3.76	3.89	3.51	3.46	3.34	2.75	2.87	3.21	2.90	2.96	2.80	2.70	2.73	2.97	3.06	3.24	3.29	3.77
District of Columbia	1.20	0.56	0.42	0.41	0.48	0.52	0.40	0.46	0.59	0.49	0.39	0.47	0.40	0.28	0.44	0.31	0.39	0.42	0.40	0.34	0.49
Florida	0.52	0.51	0.50	0.54	0.54	0.52	0.58	0.54	0.54	0.65	0.66	0.55	0.56	0.58	0.60	0.63	0.64	0.66	0.66	0.67	0.63
Georgia	0.29	0.24	0.31	0.30	0.32	0.29	0.29	0.36	0.36	0.37	0.38	0.42	0.39	0.40	0.40	0.42	0.44	0.42	0.50	0.51	0.48
Hawaii	0.17	0.13	0.24	0.20	0.30	0.21	0.19	0.21	0.20	0.21	0.19	0.19	0.21	0.17	0.20	0.25	0.21	0.30	0.28	0.34	0.26
Idaho	0.34	0.42	0.57	0.41	0.44	0.41	0.43	0.35	0.43	0.49	0.53	0.50	0.44	0.36	0.37	0.59	0.48	0.50	0.79	0.85	0.98
Illinois	1.45	1.43	1.49	1.55	1.51	1.54	1.53	1.47	1.49	1.45	1.32	1.39	1.33	1.39	1.34	1.29	1.26	1.24	1.21	1.20	1.19
Indiana	0.96	0.91	0.94	0.95	0.92	0.99	0.89	0.95	0.93	0.95	1.02	1.12	1.14	1.01	0.99	0.99	0.97	0.99	0.87	0.89	0.90
Iowa	0.58	0.60	0.60	0.61	0.55	0.67	0.70	0.59	0.58	0.64	0.66	0.68	0.69	0.71	0.71	0.74	0.71	0.70	0.69	0.65	0.66
Kansas	0.47	0.52	0.58	0.61	0.64	0.57	0.59	0.65	0.58	0.63	0.51	0.49	0.48	0.58	0.51	0.47	0.47	0.54	0.51	0.51	0.48
Kentucky	0.43	0.35	0.37	0.41	0.42	0.37	0.37	0.39	0.38	0.44	0.43	0.49	0.45	0.41	0.46	0.42	0.38	0.41	0.33	0.40	0.43
Louisiana	0.38	0.43	0.35	0.40	0.45	0.43	0.41	0.41	0.41	0.41	0.43	0.41	0.45	0.52	0.53	0.52	0.51	0.48	0.51	0.58	0.54
Maine	0.33	0.32	0.23	0.29	0.27	0.23	0.24	0.35	0.33	0.32	0.43	0.35	0.42	0.45	0.38	0.37	0.40	0.43	0.45	0.42	0.36
Maryland	1.10	1.04	1.01	1.00	1.08	1.02	0.97	0.96	1.01	1.04	1.03	1.03	1.05	0.91	0.94	0.87	0.87	0.83	0.85	0.91	0.86
Massachusetts	1.69	1.67	1.56	1.60	1.57	1.60	1.55	1.63	1.63	1.62	1.71	1.65	1.63	1.74	1.65	1.60	1.71	1.67	1.66	1.71	1.68
Michigan	1.34	1.36	1.32	1.35	1.31	1.26	1.30	1.37	1.38	1.39	1.43	1.31	1.32	1.40	1.37	1.44	1.34	1.44	1.40	1.43	1.48
Minnesota	1.04	1.02	1.03	1.12	1.16	1.06	1.13	1.11	1.21	1.19	1.28	1.24	1.34	1.37	1.49	1.40	1.51	1.52	1.52	1.58	1.50
Mississippi	0.13	0.12	0.15	0.16	0.19	0.15	0.14	0.14	0.13	0.14	0.17	0.14	0.13	0.17	0.15	0.15	0.16	0.22	0.19	0.24	0.19
Missouri	0.85	0.65	0.64	0.66	0.61	0.65	0.62	0.70	0.61	0.74	0.76	0.70	0.64	0.63	0.57	0.60	0.60	0.54	0.61	0.63	0.69
Montana	0.24	0.30	0.34	0.27	0.29	0.22	0.29	0.39	0.30	0.39	0.46	0.31	0.30	0.39	0.51	0.41	0.57	0.35	0.52	0.43	0.50
Nebraska	0.35	0.27	0.35	0.37	0.39	0.33	0.32	0.40	0.45	0.35	0.42	0.43	0.42	0.45	0.40	0.52	0.42	0.48	0.39	0.44	0.45
Nevada	0.58	0.43	0.42	0.56	0.68	0.58	0.67	0.73	0.62	0.67	0.60	0.74	0.80	0.57	0.38	0.45	0.45	0.46	0.52	0.46	0.63
New Hampshire	1.05	0.81	0.86	0.86	0.94	0.91	0.93	0.99	0.91	1.07	1.12	1.39	1.28	0.96	1.23	1.44	1.21	1.26	1.28	1.43	1.41
New Jersey	2.28	2.53	2.31	2.16	2.38	2.50	2.51	2.53	2.46	2.44	2.42	2.45	2.51	2.44	2.38	2.27	2.07	2.06	1.97	1.92	1.93
New Mexico	0.38	0.43	0.48	0.40	0.45	0.51	0.42	0.38	0.37	0.51	0.47	0.48	0.52	0.61	0.65	0.60	0.65	0.63	0.57	0.67	0.73
New York	1.23	1.24	1.22	1.21	1.15	1.20	1.22	1.19	1.12	1.16	1.13	1.17	1.10	1.11	1.13	1.12	1.11	1.12	1.13	1.18	1.22
North Carolina	0.42	0.44	0.41	0.39	0.43	0.42	0.43	0.45	0.45	0.49	0.48	0.44	0.44	0.52	0.52	0.54	0.58	0.60	0.60	0.59	0.65
North Dakota	0.29	0.21	0.25	0.33	0.23	0.23	0.37	0.39	0.29	0.26	0.32	0.26	0.24	0.36	0.29	0.44	0.35	0.29	0.41	0.34	0.48
Ohio	1.30	1.25	1.27	1.33	1.27	1.25	1.24	1.28	1.25	1.21	1.26	1.32	1.26	1.23	1.30	1.24	1.23	1.20	1.18	1.15	1.15
Oklahoma	1.19	1.24	1.09	1.21	1.12	1.09	1.02	1.18	1.14	1.22	1.24	1.18	1.22	1.34	1.30	1.17	1.06	0.98	0.92	0.94	0.88
Oregon	0.71	0.83	0.72	0.65	0.64	0.57	0.61	0.67	0.67	0.69	0.72	0.64	0.64	0.77	0.83	0.90	1.01	1.09	1.07	1.00	0.93
Pennsylvania	1.23	1.30	1.26	1.33	1.32	1.29	1.33	1.31	1.31	1.29	1.30	1.28	1.30	1.33	1.19	1.27	1.35	1.23	1.15	1.16	1.12
Rhode Island	0.88	0.93	0.79	0.88	0.88	0.78	0.78	0.79	0.66	0.77	0.83	0.68	0.75	0.73	0.73	0.66	0.60	0.76	0.78	0.74	0.94
South Carolina	0.37	0.40	0.37	0.37	0.39	0.41	0.40	0.49	0.45	0.43	0.49	0.47	0.53	0.52	0.56	0.45	0.47	0.53	0.58	0.56	0.57
South Dakota	0.34	0.23	0.21	0.27	0.27	0.31	0.27	0.30	0.18	0.19	0.23	0.38	0.26	0.20	0.31	0.27	0.31	0.29	0.23	0.25	0.19
Tennessee	0.35	0.34	0.38	0.38	0.39	0.41	0.41	0.38	0.47	0.49	0.51	0.50	0.51	0.50	0.45	0.44	0.40	0.54	0.52	0.55	0.51
Texas	0.64	0.70	0.71	0.74	0.78	0.74	0.74	0.77	0.80	0.77	0.78	0.80	0.84	0.88	0.87	0.89	0.91	0.86	0.94	0.90	0.90
Utah	0.70	0.78	0.84	0.83	0.78	0.80	0.79	0.64	0.93	0.84	0.75	0.78	0.75	0.83	0.89	0.83	0.91	0.85	0.96	0.99	1.03
Vermont	1.03	0.88	0.88	0.78	0.71	0.69	0.73	0.82	0.55	0.64	0.83	0.84	0.87	0.99	0.95	1.03	0.89	0.97	1.06	1.19	0.88
Virginia	0.58	0.81	0.60	0.56	0.57	0.62	0.59	0.53	0.59	0.58	0.60	0.64	0.60	0.81	0.64	0.55	0.54	0.48	0.59	0.63	0.65
Washington	0.57	0.54	0.60	0.61	0.67	0.68	0.70	0.89	0.74	0.74	0.70	0.75	0.75	0.71	0.81	0.82	0.86	0.85	0.96	0.94	0.93
West Virginia	0.31	0.33	0.31	0.34	0.36	0.38	0.38	0.51	0.48	0.42	0.50	0.45	0.45	0.41	0.35	0.43	0.38	0.38	0.42	0.45	0.44
Wisconsin	1.06	0.99	1.05	0.99	0.89	0.85	0.92	0.87	0.91	0.96	0.93	0.99	1.05	0.99	1.04	1.07	1.09	1.11	1.18	1.15	1.09
Wyoming	0.51	0.34	0.32	0.45	0.34	0.59	0.36	0.46	0.41	0.44	0.40	0.33	0.35	0.35	0.30	0.52	0.51	0.28	0.34	0.31	0.46

Table A-4. UTILITY PATENT APPLICATIONS FROM FOREIGN INVENTORS, BY COUNTRY OF ORIGIN, 1971-1991

COUNTRY	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	TOTAL 1971-1991
JAPAN	7418	6831	8565	9163	8566	9365	9674	10189	11185	12951	14009	16068	15998	18473	21431	22895	24516	28357	31791	34113	36846	358404
GERMANY	7772	7782	8603	8897	8258	8343	8903	9262	9261	9669	9924	10002	8901	9775	10452	10648	10783	10957	11386	11261	10874	201713
UNITED KINGDOM	4734	4811	4914	5109	4568	4529	4533	4468	4270	4178	4294	4351	4138	4370	3825	4641	4898	4788	5066	4595	4557	95637
FRANCE	2987	3122	3197	3157	3048	3005	3007	3257	3127	3331	3237	3336	3213	3507	3605	3884	3837	4301	4268	4771	4723	73920
CANADA	2025	1966	2095	2191	2127	2237	2192	2050	2061	1969	2202	2138	1995	2273	2270	2438	2791	3046	3425	3511	3641	50643
SWITZERLAND	1848	1963	2076	2057	2131	2053	1964	2056	1836	1975	1828	1820	1716	1808	1894	1929	1857	1993	2019	1931	1902	40656
ITALY	1160	1162	1128	1192	1164	1230	1224	1328	1480	1501	1384	1500	1411	1636	1628	1799	1822	1943	1964	2093	2123	31872
SWEDEN	1148	1078	1335	1357	1359	1251	1253	1221	1137	1207	1191	1144	1181	1306	1239	1229	1155	1028	1114	1057	1086	25076
NETHERLANDS	1017	916	1047	985	1040	990	1026	1028	983	1025	1077	1077	1078	1179	1221	1269	1334	1512	1570	1588	1397	24359
CHINA(TAIWAN)	28	40	66	102	113	127	174	243	262	367	394	509	530	601	760	959	1182	1246	1507	2035	2252	13497
AUSTRALIA	324	389	442	442	415	470	424	528	579	517	597	630	603	696	739	809	842	750	800	811	783	12590
BELGIUM	387	404	445	408	445	398	387	408	373	388	391	356	390	428	450	523	518	545	572	592	614	9422
AUSTRIA	369	359	398	413	370	401	402	432	447	410	449	418	421	447	498	557	504	485	511	560	516	9367
U.S.S.R	578	653	752	728	696	675	610	623	494	338	417	331	194	146	145	158	174	216	291	304	177	8700
ISRAEL	120	143	155	165	158	175	206	202	235	253	317	316	307	376	377	427	503	490	624	608	633	6790
FINLAND	154	159	176	178	173	184	203	228	231	258	275	300	346	363	399	350	430	417	513	595	592	6524
DENMARK	275	241	251	250	242	219	250	287	223	217	243	277	280	278	282	302	316	337	284	370	358	5782
SOUTH KOREA	4	19	13	22	20	27	28	34	34	33	64	68	78	74	129	162	235	295	607	775	1321	4042
SPAIN	156	138	204	175	182	172	152	144	163	142	147	159	157	196	207	225	228	231	302	289	258	4027
S. AFRICA	149	145	165	152	179	149	169	175	206	203	213	199	207	216	227	204	239	192	215	185	186	3975
HUNGARY	88	103	113	108	144	133	132	136	175	194	212	225	210	207	208	209	174	172	174	138	103	3358
NORWAY	146	115	131	156	156	137	165	172	152	104	133	152	108	153	160	177	185	159	141	164	169	3135
NEW ZEALAND	54	49	56	66	62	86	100	99	94	119	119	87	101	128	121	135	132	110	121	105	91	2035
CZECHOSLOVAKIA	166	169	167	173	142	136	92	88	80	90	82	77	74	84	68	63	50	72	71	39	32	2015
MEXICO	87	98	130	108	127	110	89	92	82	77	99	70	73	77	81	69	70	74	77	76	106	1872
BRAZIL	51	46	43	44	64	51	51	72	72	53	66	70	57	62	78	68	62	71	111	88	124	1404
IRELAND	33	26	39	36	34	51	55	42	40	43	63	48	47	56	75	83	91	103	99	130	116	1310
HONG KONG	25	13	25	33	38	33	56	45	39	56	38	55	44	46	56	66	82	86	108	86	132	1162
ARGENTINA	49	54	44	50	44	52	51	61	62	56	55	35	35	40	39	56	42	32	32	56	59	1004
POLAND	51	35	50	61	47	59	68	68	83	65	49	25	21	44	13	19	23	26	24	13	21	865
CHINA (PEOPLES REP.)	0	0	0	0	12	9	9	6	15	7	10	5	12	18	24	112	83	122	112	111	126	793
BULGARIA	20	28	35	37	51	70	40	48	36	40	30	37	39	22	40	41	32	42	30	31	11	760
INDIA	22	21	24	43	32	39	27	24	25	23	22	20	15	30	25	36	26	41	50	58	51	654
LUXEMBOURG	11	14	26	21	17	23	28	28	34	23	51	45	49	41	29	40	31	39	35	32	36	653
VENEZUELA	5	19	18	11	19	26	16	19	20	25	23	26	23	28	40	49	41	30	26	48	43	555
YUGOSLAVIA	10	20	17	15	16	17	21	25	34	21	28	24	20	11	22	28	35	35	39	34	30	502
ROMANIA	53	65	29	42	29	20	22	30	17	9	13	8	7	6	4	2	3	0	2	1	1	363
LIECHTENSTEIN	23	11	20	20	28	13	15	20	10	29	18	10	17	21	11	15	12	11	15	13	14	346
OTHER	93	148	150	288	253	229	250	237	302	265	245	291	217	221	260	270	264	279	284	648	247	5441
TOTAL	33640	33355	37144	38455	36569	37294	38068	39475	39959	42231	44009	46309	44313	49443	53132	56946	59602	64633	70380	73915	76351	1015223

SOURCE: USPTO/TAF Program Data.

Country of Origin is based on the residence of the first-named inventor.

Table A-5. UTILITY PATENT GRANTS ISSUED TO FOREIGN INVENTORS, BY COUNTRY OF ORIGIN, 1971-1991

COUNTRY	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	TOTAL 1971-1991
JAPAN	4029	5151	4941	5894	6352	6543	6217	6912	5251	7124	8388	8149	8793	11110	12746	13209	16557	16158	20168	19524	21029	214245
GERMANY	5523	5729	5587	6153	6057	6211	5563	5874	4546	5782	6304	5467	5477	6323	6718	6856	7885	7353	8353	7610	7680	133051
UNITED KINGDOM	3465	3167	2855	3146	3043	2995	2654	2722	1910	2406	2475	2134	1931	2271	2495	2409	2779	2583	3100	2789	2801	56130
FRANCE	2214	2229	2144	2569	2367	2408	2108	2119	1604	2088	2181	1975	1895	2162	2400	2369	2874	2661	3140	2866	3030	49403
CANADA	1328	1242	1347	1326	1296	1192	1219	1226	862	1081	1135	990	1000	1206	1342	1314	1594	1489	1959	1861	2036	28045
SWITZERLAND	1281	1305	1326	1454	1456	1475	1347	1330	1025	1265	1239	1147	1017	1174	1233	1212	1373	1245	1363	1284	1335	26886
ITALY	726	839	759	807	738	754	756	725	596	806	883	752	625	794	919	995	1183	1076	1297	1260	1209	18499
SWEDEN	842	777	762	925	914	1002	862	826	573	822	766	685	623	701	657	883	948	777	837	768	716	16866
NETHERLANDS	695	673	686	731	617	744	708	659	525	654	641	619	626	726	766	722	922	806	1060	958	992	15530
AUSTRALIA	200	182	202	234	248	261	243	281	211	265	319	266	237	292	340	374	389	416	503	432	463	6358
AUSTRIA	251	271	237	294	310	296	243	274	222	267	279	229	267	256	318	357	345	337	399	393	359	6204
U.S.S.R	336	359	384	496	421	426	394	412	354	460	373	209	222	214	147	116	121	96	161	174	178	6053
BELGIUM	305	319	283	348	277	334	255	264	185	244	263	224	205	240	240	243	295	302	359	313	324	5822
CHINA(TAIWAN)	15	8	10	22	23	28	52	29	38	65	80	88	65	99	174	208	343	457	592	732	904	4032
DENMARK	170	173	154	176	146	178	155	168	105	157	130	121	125	150	187	182	204	151	221	158	210	3421
FINLAND	59	69	88	109	98	109	105	125	77	121	140	125	116	167	200	210	275	232	230	304	331	3290
ISRAEL	54	55	84	89	95	105	94	99	84	113	123	114	109	162	179	189	245	238	326	299	307	3163
NORWAY	77	88	84	91	103	103	106	89	80	79	93	65	66	87	90	81	135	121	126	112	111	1987
SPAIN	74	60	87	89	93	102	96	92	49	65	58	49	50	69	78	97	115	126	131	130	153	1863
S. AFRICA	71	54	86	86	74	83	68	81	64	74	111	73	61	82	96	88	107	103	135	115	105	1617
HUNGARY	38	48	46	62	51	75	80	66	63	87	98	112	106	111	108	131	127	94	129	93	85	1810
CZECHOSLOVAKIA	153	110	94	112	117	111	93	91	50	55	41	50	38	33	54	35	46	33	34	39	27	1416
SOUTH KOREA	2	7	5	7	13	7	6	12	5	8	17	14	26	30	39	45	84	97	159	225	402	1210
MEXICO	64	43	42	51	67	78	42	24	36	41	43	35	32	42	32	37	49	44	39	32	28	901
NEW ZEALAND	17	26	25	20	26	33	32	41	23	51	47	44	38	50	33	52	68	55	58	52	41	834
IRELAND	29	18	28	17	15	20	17	21	10	17	17	24	18	29	30	28	38	43	65	54	55	593
BRAZIL	14	18	18	21	17	18	21	24	19	24	23	27	19	20	30	27	34	29	36	41	61	539
HONG KONG	20	7	15	9	10	20	9	21	13	27	33	16	14	24	25	31	34	41	48	52	50	521
POLAND	31	21	25	27	36	26	24	33	29	37	38	26	20	15	11	14	13	8	14	17	8	473
ARGENTINA	22	29	28	24	24	24	20	21	24	16	25	18	21	20	11	17	18	16	20	17	16	433
LUXEMBOURG	8	6	8	19	16	15	16	18	21	13	27	26	27	24	37	31	22	29	29	17	27	432
BULGARIA	11	10	18	13	24	19	33	32	14	23	27	13	19	22	21	21	32	23	16	27	10	426
LIECHTENSTEIN	28	10	14	15	13	21	11	11	8	18	20	19	12	16	13	18	18	10	11	15	11	308
CHINA (PEOPLES REP.)	0	0	0	0	1	6	1	0	2	1	3	0	1	2	1	9	23	47	52	47	51	247
INDIA	10	19	21	17	13	17	13	14	14	4	6	4	14	12	10	18	12	14	14	23	22	291
ROMANIA	35	33	25	35	17	15	16	11	10	14	10	5	2	5	3	2	5	1	0	1	1	248
VENEZUELA	13	7	8	7	0	0	0	2	11	11	12	10	5	11	15	21	24	20	23	20	25	243
YUGOSLAVIA	9	6	5	11	5	9	6	9	8	15	6	10	9	15	16	3	13	18	15	22	22	230
OTHER	118	116	114	122	90	83	97	92	54	81	72	58	58	68	92	82	86	81	132	95	123	1892
TOTAL	22333	23286	22639	25628	25285	25946	23784	24848	18773	24463	26548	23992	23989	28834	32106	32734	39433	37426	45354	42971	45338	615712

SOURCE: U.S. Patent and Trademark Office, Office of Electronic Information Products and Services, TAF Report—Patent Counts by Country/State and Year.

Country of Origin is based on the residence of the first-named inventor.

Table A-6
U.S. Patent Classification System Classes Receiving Greater or Lesser Patenting Emphasis, 1980 and 1990, Residents of UNITED STATES

CLASS	TITLE (partial)	ACTIVITY INDEX 1980	1990
Greater Emphasis			
208	Mineral Oils: Processes and Products	1.769	2.007
166	Wells	1.692	1.912
585	Chemistry, Hydrocarbons	1.748	1.889
436	Chemistry-Analytical and Immunological Testing	1.433	1.592
502	Catalyst, Solid Sorbent, Or Support Therefore....	1.520	1.471
330	Amplifiers	1.231	1.470
521	Synthetic Resins or Natural Rubber—Part of Class 520....	1.217	1.464
501	Compositions: Ceramic	1.138	1.386
424	Drug, Bio-Affecting and Body Treating Compositions	0.930	1.368
439	Electrical Connectors	1.623	1.368
375	Pulse or Digital Communications	1.102	1.358
361	Electricity, Electrical Systems and Devices	1.283	1.344
435	Chemistry: Molecular Biology and Microbiology	1.102	1.341
422	Process Disinfecting, Deodorizing, Preserving....	1.207	1.330
426	Food or Edible Material: Processses, Compositions...	1.219	1.328
252	Compositions	1.381	1.315
364	Electrical Computers and Data Processing Systems	1.420	1.313
Lesser Emphasis			
123	Internal-Combustion Engines	0.491	0.601
114	Ships	0.514	0.601
180	Motor Vehicles	0.794	0.590
70	Locks	0.595	0.572
5	Beds	0.631	0.570
4	Baths, Closets, Sinks and Spittoons	0.617	0.553
24	Buckles, Buttons, Clasps, Etc.	0.707	0.550
280	Land Vehicle	0.555	0.540
400	Typewriting Machines	1.145	0.518
30	Cutlery	0.712	0.516
2	Apparel	0.491	0.467
272	Amusement and Exercising Devices	0.312	0.461
369	Dynamic Information Storage or Retrieval	0.777	0.443
273	Amusement Devices, Games	0.436	0.396
354	Photography	0.526	0.341
43	Fishing, Trapping and Vermin Destroying	0.328	0.339
84	Music	0.748	0.234

A country's activity index for a class is determined by taking the proportion of (utility) patents granted in the class which originated in the country and dividing it by the proportion of all (utility) patents granted in all classes which originated in that country. Only classes for which at least 200 patents were granted have been included in the calculation of the index.

SOURCE: USPTO/TAF Program Report—Country Activity Index Report, 1990, prepared for the National Science Foundation.

Table A-6 (continued).
U.S. Patent Classification System Classes Receiving Greater or Lesser Patenting Emphasis, 1980 and 1990, Residents of JAPAN

CLASS	TITLE (partial)	ACTIVITY INDEX 1980	1990
Greater Emphasis			
354	Photography	4.606	3.470
355	Photocopying	2.776	3.408
369	Dynamic Information Storage or Retrieval	3.298	3.276
365	Static Information Storage and Retrieval	1.243	2.832
430	Radiation Imagery Chemistry-Process, Composition....	3.332	2.709
360	Dynamic Magnetic Information Storage or Retrieval	3.235	2.648
400	Typewriting Machines	1.388	2.601
346	Recorders	2.306	2.573
358	Pictorial Communication; Television	2.578	2.510
382	Image Analysis	2.082	2.254
357	Active Solid State Devices, e.g., Transistors...	2.061	2.213
123	Internal Combustion Engines	3.106	2.123
84	Music	2.468	2.059
180	Motor Vehicles	1.091	2.032
74	Machine Elements and Mechanisms	1.338	1.893
318	Electricity, Motive Power Systems	1.754	1.886
192	Clutches and Power-Stop Control	1.614	1.883
Lesser Emphasis			
33	Geometrical Instruments	0.540	0.231
606	Surgery	0.259	0.230
222	Dispensing	0.210	0.227
4	Baths, Closets, Sinks and Spittoons	0.053	0.213
5	Beds	0.115	0.208
623	Prosthesis (i.e., Artificial Body Members), Parts....	0.450	0.199
208	Mineral Oils: Processes and Products	0.503	0.197
604	Surgery	0.264	0.196
119	Animal Husbandry	0.230	0.186
405	Hydraulic and Earth Engineering	0.638	0.166
244	Aeronautics	0.096	0.156
102	Ammunition and Explosives	0.063	0.115
2	Apparel	0.062	0.102
43	Fishing, Trapping and Vermin Destroying	0.347	0.101
272	Amusement and Exercising Devices	0.193	0.070
211	Supports, Racks	0.000	0.070
166	Wells	0.000	0.037

A country's activity index for a class is determined by taking the proportion of (utility) patents granted in the class which originated in the country and dividing it by the proportion of all (utility) patents granted in all classes which originated in that country. Only classes for which at least 200 patents were granted have been included in the calculation of the index.

SOURCE: USPTO/TAF Program Report—Country Activity Index Report, 1990, prepared for the National Science Foundation.

Table A-6 (continued).
U.S. Patent Classification System Classes Receiving Greater or Lesser Patenting Emphasis, 1980 and 1990, Residents of WEST GERMANY

CLASS	TITLE (partial)	ACTIVITY INDEX 1980	1990
Greater Emphasis			
102	Ammunition and Explosives	1.248	3.008
544	Organic Compounds-Part of Class 532-570 Series	1.455	2.822
562	Organic Compounds-Part of Class 532-570 Series	1.873	2.702
71	Chemistry, Fertilizers	1.156	2.567
568	Organic Compounds-Part of Class 532-570 Series	1.881	2.545
101	Printing	2.068	2.439
560	Organic Compounds-Part of Class 532-570 Series	1.479	2.379
198	Conveyers, Power Driven	1.148	2.290
546	Organic Compounds-Part of Class 532-570 Series	1.919	2.239
242	Winding and Reeling	1.728	2.197
548	Organic Compounds-Part of Class 532-570 Series	1.202	2.162
106	Compositions, Coating or Plastic	1.291	2.110
378	X-Ray or Gamma Ray Systems or Devices	2.783	2.040
549	Organic Compounds-Part of Class 532-570 Series	1.396	1.986
526	Synthetic Resins or Natural Rubbers-Part of Class 520 Series	1.269	1.875
241	Solid Material Comminution or Disintegration	1.446	1.859
384	Bearing or Guides	2.648	1.856
Lesser Emphasis			
369	Dynamic Information Storage or Retrieval	0.328	0.271
126	Stoves and Furnaces	0.343	0.260
354	Photography	1.440	0.259
365	Static Information Storage and Retrieval	0.410	0.239
114	Ships	0.360	0.187
346	Recorders	0.887	0.158
119	Animal Husbandry	0.182	0.155
5	Beds	0.076	0.145
446	Amusement Devices, Toys	0.208	0.120
2	Apparel	0.328	0.057
84	Music	0.264	0.053
355	Photocopying	1.126	0.051
43	Fishing, Trapping and Vermin Destroying	0.000	0.047
272	Amusement and Exercising Devices	0.170	0.039
166	Wells	0.096	0.035
273	Amusement Devices, Games	0.150	0.019
4	Baths, Closets, Sinks and Spittoons	0.000	0.000

A country's activity index for a class is determined by taking the proportion of (utility) patents granted in the class which originated in the country and dividing it by the proportion of all (utility) patents granted in all classes which originated in that country. Only classes for which at least 200 patents were granted have been included in the calculation of the index.

SOURCE: USPTO/TAF Program Report—Country Activity Index Report, 1990, prepared for the National Science Foundation.

Table A-6 (continued).
U.S. Patent Classification System Classes Receiving Greater or Lesser Patenting Emphasis, 1980 and 1990, Residents of GREAT BRITAIN

CLASS	TITLE (partial)	ACTIVITY INDEX 1980	1990
Greater Emphasis			
514	Drug, Bio-Affecting and Body Treating Compositions	2.752	2.931
342	Communications, Directive Radio Wave Systems....	1.342	2.412
549	Organic Compounds-Part of Class 532-570 Series	1.389	2.389
252	Compositions	1.771	2.286
411	Expanded, Threaded, Headed, and Driven Fasteners....	1.655	2.177
285	Pipe Joints or Couplings	1.025	2.161
244	Aeronautics	0.775	2.124
71	Chemistry, Fertilizers	1.539	1.946
350	Optics, Systems and Elements	1.660	1.851
251	Valves and Valve Actuation	0.783	1.796
164	Metal Founding	0.826	1.791
250	Radiant Energy	0.857	1.790
239	Fluid Sprinkling, Spraying and Diffusing	1.475	1.720
546	Organic Compounds-Part of Class 532-570 Series	0.404	1.690
106	Compositions, Coating or Plastic	2.116	1.683
370	Multiplex Communications	1.148	1.682
455	Telecommunications	0.884	1.629
Lesser Emphasis			
355	Photocopying	0.396	0.236
272	Amusement and Exercising Devices	0.000	0.218
273	Amusement Devices, Games	0.308	0.209
296	Land Vehicles, Bodies and Tops	0.354	0.201
360	Dynamic Magnetic Information Storage or Retrieval	0.216	0.170
70	Locks	0.710	0.170
56	Harvesters	0.542	0.152
119	Animal Husbandry	0.298	0.145
4	Baths, Closets, Sinks and Spittoons	0.513	0.138
606	Surgery	0.210	0.094
354	Photography	0.258	0.080
43	Fishing, Trapping and Vermin Destroying	0.000	0.000
84	Music	0.541	0.000
211	Supports, Racks	0.000	0.000
369	Dynamic Information Storage or Retrieval	1.211	0.000
433	Dentistry	0.278	0.000
446	Amusement Devices, Toys	0.256	0.000

A country's activity index for a class is determined by taking the proportion of (utility) patents granted in the class which originated in the country and dividing it by the proportion of all (utility) patents granted in all classes which originated in that country. Only classes for which at least 200 patents were granted have been included in the calculation of the index.

SOURCE: USPTO/TAF Program Report—Country Activity Index Report, 1990, prepared for the National Science Foundation.

Table A-6 (continued).
U.S. Patent Classification System Classes Receiving Greater Patenting Emphasis, 1980 and 1990, Residents of TAIWAN

CLASS	TITLE (partial)	ACTIVITY INDEX 1980	1990
Greater Emphasis			
292	Closure Fasteners	0.000	10.034
84	Music	0.000	9.474
126	Stoves and Furnaces	0.000	6.193
379	Telephonic Communications	0.000	4.924
206	Special Receptacle or Package	0.000	4.747
272	Amusement and Exercising Devices	0.000	4.649
340	Communications, Electrical	0.000	4.271
437	Semiconductor Device Manufacturing Process	0.000	4.239
562	Organic Compounds-Part of Class 532-570 Series	0.000	3.924
521	Synthetic Resins or Natural Rubbers-Part of Class 520 Series	0.000	3.886
307	Electrical Transmission or Interconnection Systems	0.000	3.704
544	Organic Compounds-Part of Class 532-570 Series	0.000	3.653
70	Locks	0.000	3.620
446	Amusement Devices, Toys	131.530	3.587
280	Land Vehicle	0.000	3.467
560	Organic Compounds-Part of Class 532-570 Series	0.000	3.373
346	Recorders	0.000	3.146

A country's activity index for a class is determined by taking the proportion of (utility) patents granted in the class which originated in the country and dividing it by the proportion of all (utility) patents granted in all classes which originated in that country. Only classes for which at least 200 patents were granted have been included in the calculation of the index.

SOURCE: USPTO/TAF Program Report—Country Activity Index Report, 1990, prepared for the National Science Foundation.

Table A-7. NUMBER AND PERCENT OF UTILITY PATENTS ELIGIBLE TO EXPIRE AT FOUR YEARS FOR NON-PAYMENT OF MAINTENANCE FEES, BY YEAR OF ISSUE

	1981			1982			1983			1984			1985			1986			1987 (1)		
	Eligible to Expire	Number Expired	Percent Expired	Eligible to Expire	Number Expired	Percent Expired	Eligible to Expire	Number Expired	Percent Expired	Eligible to Expire	Number Expired	Percent Expired	Eligible to Expire	Number Expired	Percent Expired	Eligible to Expire	Number Expired	Percent Expired	Eligible to Expire	Number Expired	Percent Expired
U.S. ORIGIN																					
Corporation Owned	129	14	11%	6129	685	11%	19203	2232	12%	27001	3164	12%	28668	3127	11%	27390	3084	11%	19544	2347	12%
Government Owned	6	4	67%	230	116	50%	837	345	41%	1168	277	24%	1101	204	19%	996	167	17%	613	101	16%
Individual Owned (Independent Inventors)	29	7	24%	1705	673	39%	5694	2015	35%	8426	2749	33%	9052	2705	30%	9386	2831	30%	6733	2096	31%
Total U.S. Origin	164	25	15%	8064	1474	18%	25734	4592	18%	36595	6190	17%	38821	6036	16%	37772	6082	16%	26890	4544	17%
FOREIGN ORIGIN																					
Corporation Owned	40	1	3%	3851	470	12%	15343	2032	13%	23971	3164	13%	27575	3554	13%	28261	3606	13%	21335	2739	13%
Government Owned	0	0	0%	55	4	7%	219	39	18%	409	73	18%	470	81	17%	477	90	19%	336	64	19%
Individual Owned (Independent Inventors)	3	0	0%	476	130	27%	2067	524	25%	3204	790	25%	3585	930	26%	3812	958	25%	2737	743	27%
Total Foreign Origin	43	1	2%	4382	604	14%	17629	2595	15%	27584	4027	15%	31630	4565	14%	32550	4654	14%	24408	3546	15%
TOTAL	207	26	13%	12446	2078	17%	43363	7187	17%	64179	10217	16%	70451	10601	15%	70322	10736	15%	51298	8090	16%
BY COUNTRY OF ORIGIN																					
Japan	17	0	0%	1513	68	4%	6588	398	6%	10711	677	6%	12588	711	6%	13172	770	6%	10225	556	5%
Germany	9	1	11%	1075	209	19%	4049	807	20%	6038	1180	20%	6597	1305	20%	6803	1362	20%	4849	1026	21%
United Kingdom	6	0	0%	357	74	21%	1378	286	21%	2138	465	22%	2454	514	21%	2391	527	22%	1757	409	23%
France	3	0	0%	292	37	13%	1309	214	16%	2058	389	19%	2370	436	18%	2351	417	18%	1791	327	18%
Canada	2	0	0%	214	60	28%	785	201	26%	1146	238	21%	1324	306	23%	1306	292	22%	989	227	23%
Switzerland	2	0	0%	226	34	15%	746	166	22%	1113	218	19%	1203	215	18%	1203	187	16%	874	147	17%
Others	4	0	0%	705	122	17%	2774	523	19%	4380	862	20%	5094	1078	21%	5324	1099	21%	3923	854	22%
U.S.	164	25	15%	8064	1474	18%	25734	4592	18%	36595	8190	17%	38821	6036	18%	37772	6082	16%	26890	4544	17%
TOTAL	207	26	13%	12446	2078	17%	43363	7187	17%	64179	10217	18%	70451	10601	15%	70322	10736	15%	51298	8090	16%

(1) Only Partial data for 1987 are depicted. "Eligible to Expire" data include patents issued January to mid-August 1987, only.

SOURCE: USPTO/TAF Data Base.

TABLE A-8 NUMBER AND PERCENT OF UTILITY PATENTS ELIGIBLE TO EXPIRE AT EIGHT YEARS FOR NON-PAYMENT OF MAINTENANCE FEES, BY YEAR OF ISSUE

	1981			1982			1983 (2)		
	Eligible to Expire (1)	Number Expired	Percent Expired	Eligible to Expire	Number Expired	Percent Expired	Eligible to Expire	Number Expired	Percent Expired
U.S. ORIGIN									
Corporation Owned	115	25	22%	5444	1100	20%	8493	1653	19%
Government Owned	2	1	50%	114	64	56%	252	129	51%
Individual Owned (Independent Inventors)	22	6	27%	1034	435	42%	1729	741	43%
Total U.S. Origin	139	32	23%	6592	1599	24%	10474	2523	24%
FOREIGN ORIGIN									
Corporation Owned	40	13	33%	3381	770	23%	6355	1379	22%
Government Owned	0	0	0%	51	8	16%	94	27	29%
Individual Owned (Independent Inventors)	2	1	50%	346	123	36%	781	268	34%
Total Foreign Origin	42	14	33%	3778	901	24%	7230	1674	23%
TOTAL	181	46	25%	10370	2500	24%	17704	4197	24%
COUNTRY OF ORIGIN									
Japan	17	4	24%	1445	186	13%	2911	382	13%
Germany	8	4	50%	866	323	37%	1601	517	32%
United Kingdom	6	2	33%	283	79	28%	518	141	27%
France	3	1	33%	255	56	22%	517	138	27%
Canada	2	1	50%	192	41	21%	298	85	29%
Switzerland	2	0	0%	154	60	39%	276	83	30%
Others	4	2	50%	583	156	27%	1109	328	30%
U.S.	139	32	23%	6592	1599	24%	10474	2523	24%
TOTAL	181	46	25%	10370	2500	24%	17704	4197	24%

(1) The number of patents eligible to expire at eight years represents the number of patents subject to the eight year maintenance fee, less the number of patents that expired at four years due to nonpayment of the four-year maintenance fee.

(2) Only partial data for 1983 are depicted. "Eligible to Expire" data include patents issued January to mid-August 1983, only.

SOURCE: USPTO/TAF Data Base.